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To consider and take action upon all general questions relating to the navigation and carrying business of the Great Lakes, maintain necessary shipping offices and in general to protect the common interests of Lake Carriers, and improve the character of the service rendered to the public.

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THE WORLD'S NAVAL PROGRESS FOR 1900.

The most important contribution, and the one possessing the most popular interest, in "Notes on Naval Progress for 1900," which have recently been published under the direction of Capt. C. B. Sigsbee, chief intelligence officer of the navy, dated July 1, is an article by Lieut. Wm. M. Howard, entitled "Increase in Naval Strength as Shown by the Naval Budgets." A study of the budgets and programme of construction of the various naval powers indicates that in the early years of the coming century the great navies of the world will continue to add to their fleets with increasing rapidity.

As usual, it is Great Britain which leads the way by voting the largest sum of any of the Powers for the support and increase of her navy. So rapid, however, has been the growth of other navies which may at any time become her combined opponents, that the progressive element in naval affairs in that country considers the Admiralty programme for this year altogether inadequate. In laying it down as the principle for her guidance that the British navy must be more than equal to any other two navies combined, England has set herself a truly stupendous task, the magnitude of which can best be appreciated when we look at the extraordinary development taking place in the German, French and Russian navies. The British programme calls for the laying down this year of two battleships, six first-class armored cruisers, one second-class cruiser and half a dozen sloops, gunboats and torpedo boats. Including these, the number of vessels under construction in 1900 is seventeen battleships (only one less than the total number of battleships already constructed, building, or proposed for our own navy), twenty armored cruisers, one first-class protected cruiser, two second-class protected cruisers, one third-class cruiser, eight sloops, four torpedo boats, twenty-one destroyers and one royal yacht. In 1899 England added nineteen vessels with an aggregate tonnage of 122,322 tons to her fleet, while in 1898 she added thirty ships with a total tonnage of 140,988 tons. This year's budget provides for an increase of 4,240 in the personnel, an addition which will bring the total strength up to 114,880 officers and men. The total naval estimates for the year 1900-1901 amounted to $137,613,000.

The French shipbuilding programme of 1896, which covered a period extending to 1907, called for the construction of 220 vessels. In addition to this, the programme for this year authorizes the construction of the following types of vessels, which are considered necessary to render the French fleet more homogeneous than it is at present: Six battleships, five armored cruisers, twenty-eight destroyers, one hundred and twelve torpedo boats, and twenty-six submarine torpedo boats. When the programme is completed, the French fleet will consist of twenty-eight battleships, twenty-four armored cruisers, fifty-two destroyers, two hundred and sixty-three torpedo boats and thirty-eight submarine boats. The total cost of the old and the additional programme will be $142,440,000.

The expressed determination of Germany to become a great naval power lends particular interest to that part of the report which deals with her navy. The policy of the Emperor is "to provide the German empire with a navy so strong that no power will dispute with her upon the high seas." Although there is considerable opposition to the bill to carry into effect the latest proposals for an increase, it is pointed out in the report that even if these proposals should fail to be put through, the programme as already authorized insures possession by Germany in the early part of the coming century of an extremely powerful fleet. In 1900 it consists of seventeen battleships, ten large cruisers, twenty small cruisers, twelve divisions of torpedo boats. In 1908 Germany will possess twenty-nine battleships, twenty large cruisers, fifty-one small cruisers, and sixteen divisions of torpedo boats; while in 1916 she will possess thirty-eight battleships, twenty large cruisers, forty-five small cruisers and sixteen divisions of torpedo boats.

The naval budget of Italy for the year 1900-1901 amounts to $24,435,000, while an annual expenditure of $2,000,000 has been authorized for the period ending in 1903. Italy has at present on the stocks four first-class battleships, three armored cruisers, three small cruisers, ten destroyers, and three first-class torpedo boats, in addition to two first-class battleships of what is known as Admiral Bettolo's naval programme.

The activity of Japan is shown in the fact that the 117 warships called for by the naval programme of 1895 have been completed, or are under construction, and it is likely that a new programme will shortly be laid down. The budget for 1900 calls for the expenditure of $46,946,000.

Russia, like Germany and France, has now formulated a programme of naval construction. The sum of $45,000,000 was voted in 1898 for the completion in six years of ten armored cruisers, ten second-class cruisers, and twenty destroyers. This was a special programme, additional to the regular annual naval estimates. Although Russsa's naval budget has increased from $29,000,000 in 1897, to $45,000,000 in 1900, it is reported that the government will shortly announce a new programme for the increase of her fleet.

Spain is selling her obsolete warships, and with the money thus secured two vessels of about 2,000 tons displacement are to be constructed and used for the training of officers and men. The money voted under the budget of this year is to be spent in completing and increasing the crews of the Pelayo, Carlos V., Numancia, Vittoria and Nautilus.

Comparing our own progress with that of the other naval powers, it is evident that there must be no relaxation in our naval activity. Although we have not laid down programmes of construction extending over several years, our present system of authorizing a certain number of ships each year, if maintained at the rate which has marked our recent progress, will enable us to retain our position as fourth naval power; but it is evident that any relaxation, such as would be caused by the failure of Congress to vote naval appropriations in any particular year, would cause us to lose our present creditable standing.

Following custom, these Notes on Naval Progress are brought up to July 1, 1900. As the publication of the last annual was delayed—that number including notes to November, 1899—the period covered by the present number is shorter than usual.

It was hoped that an account of the Japanese naval manœuvres might be given in this number, but as the attendance of foreign officers and press representatives was not permitted, information of sufficient value for publication is not available.

Especial attention is directed to an article on "The Electrical Equipment of Ships of War," by Mr. C. E. Grove, a liberal quotation from which appears in Chapter 5, and also to the lecture on "The Employment of Spark Telegraphy in the Navy," by Mr. A. Slaby, in the same chapter. It is believed that these articles are of special interest to the service.

C. D. SIGSBEE,
Captain, U. S. N., Chief Intelligence Officer.

Navy Department, July 1, 1900.

Approved, A. S. Crowninshield, Chief of the Bureau of Navigation.

MACHINE FOR CASTING STEEL CHAIN.

A patent has been taken out in England recently, according to an exchange, for a casting for cables such as are used on board ship as anchor cables, mooring chains and the like; and it has mainly for its object to provide an apparatus by which such cables can be made by casting links of steel one into the other. According to the method of manufacturing chain from links and cables the links are made of circular form and subsequently pressed or forged to the desired elliptical shape, with the usual stud or strut filled in them, and after this they may be annealed or treated to any of the well-known processes to which steel is subjected. The chain or cable is made up of links in which a cast link is cast within another link—say at the end of a piece of completed cable—or within that link and another separately made link. In the latter case, when the cast link is formed, two links are added on to the cable. A link-casting apparatus, when ready to receive the molten metal for the formation of a link, comprises a body or base having covers on the upper side and secured thereto by hinges at their outer ends. A gap extends literally through the base or body and in which the existing link or links rest during the operation of casting fresh links and a space equivelant to the gap is provided between the two inner ends of the covers and through which a part of the existing link or links extend, the molds fitting or resting partly in the body and partly in the cover in chambers or recesses formed by the two. A runner is provided in one of the covers for conveying the molten metal to the mold or lining material which is made up of four semi-cylindrical pieces, two of which when placed end to end form the upper half of the mold, while the other two similarly placed together form the other half of it. To place the sand molds or lining segments in the metal box, the covers are thrown up off the base, and the links to and through which a new link is to be cast, being placed in position in the chambers or recesses. Then the covers are moved down over the molds and the whole apparatus is then ready to receive a charge of molten steel. In this condition the mold will thus bridge or span the gap and be within the links, to which the new link is to be added.

THE six-masted schooner Eleanor A. Percy, the largest vessel of her class ever built, was launched at Bath, Me., on the 10th inst. The dimensions of the vessel are: Length, 233.5 feet; width, 50 feet; depth, 24.8 feet; gross tonnage, 3,401.96. The schooner will cost $140,000.

CLEVELAND.

Special Correspondence to The Marine Record.

The keel for the second Gilchrist steamer was laid at Lorain this week. A force of new men numbering 130 has been hired during the past two weeks, and the work on hand at the shipyard is to be pushed rapidly forward.

The first of the steamers building for Capt. John Mitchell at this port will be launched November 3. She will be christened John J. Albright, after a leading coal and iron man of Buffalo. The new boat will be operated by the Etna Steamship Co.

The steamer Paraguay, 2,201 gross and 1,323 tons net, built at the yards of the American Ship Building Co., at Lorain, O., hails from this port, according to the official numbers and signal letters granted by the Bureau of Navigation, this week.

Mr. William Johnson, a Liverpool shipowner, was here this week and called on the officials of the American Ship Building Co. Mr. Johnson did not make known his business, but he is apparently much interested in the Welland canal trade and inquired about vessels of that class.

Cleveland's grain trade is growing steadily, and the Cleveland Grain Co. has decided to double its elevator capacity. The house operated by that company for the past few years is 500,000 bushels, and it is to be increased to 1,000,000 bushels. Work on the addition to the elevator will be completed before the close of navigation.

A vessel manager said this week that owners would make money by canceling their insurance and laying their boats up Nov. 1. All the vessels that will be thrown on the market when the season ore contracts expire will be unable to find cargoes, and considerable tonnage will be forced to lay up for the winter unless freights come to a fair living rate.

The Cleveland & Toledo line comes out with the announcement that an excursion will be run to Toledo for $1 and the C. B. line announces another to Niagara Falls for $1.50. These rates to the two places have never been equaled and are occasioned by the desire of the management of the two companies to induce travel now that the regular business has fallen away.

Some of the shippers reported that coal is coming forward a little more freely, but offerings of tonnage are liberal and the feeling is easy at 25 cents to Chicago and Milwaukee and 30 cents to Lake Superior ports. Ore rates are steady, and it is not likely that there will be much change, as there is not enough wild business to cut any figure. A little business was done in lumber yesterday at $2.50 from the head of Lake Superior.

The lake vessels are taking care of the iron ore movement with ease and despatch. September makes another good showing. Ore shipments from all ports for the month were 2,519,043 tons, making the total movement to October 1, 14,885,065. For September last year the shipments were 2,394,406 tons, and for the season to October 1, 13,044,874 tons. The increase in the shipments to October 1 are therefore 1,840,191 tons.

At a meeting of the board of directors of the Cleveland & Buffalo Transit Co., on Wednesday it was decided that a new boat should be provided for the line between Cleveland and Buffalo to take care of the Pan-American Exposition business. Just what steamer is to be obtained, or whether one is to be built, does not appear now, but the advices of General Manager T. F. Newman are that she will be capable of carrying both passengers and freight.

The coal and ore freight market is very dull, but no further change in rates is noted. Offerings of coal tonnage are liberal, and shippers to the leading Lake Michigan ports are getting all the boats they want at the cut rate of Saturday. A big shipper said yesterday that the rate should be left at 30 cents and that it was a mistake to break it to 25 cents. The rate to Portage and the head of Lake Superior is unchanged at 30 cents. Very little chartering is being done in the ore trade.

Commodore George Gardner's suggestion of a school ship for the lakes, in combination with a shore school was made several years ago, and was vigorously pushed by him at the time, with a strong hope of its being adopted, because of the general approval it received. It wss a wise suggestion, and had it been carried into effect there would long before this have been a store of trained seamen to draw upon for the lake merchant marine, or for the United States Navy, supplying a need strongly felt in the latter service at the present time.

A correspondent from Egypt writing to the Engineering News says: While we write we see pieces of six steam coal hoists being discharged on the Alexandria quay, and notice that they are made by the Brown Hoisting and Conveying Machine Company of Cleveland. These machines, called by the makers "independent truss bridge tramways," are designed to unload coal from the holds of ships or into trucks—2,160 tons of coal in a day of ten hours. Working their hardest, the coal men have hitherto been able to discharge only 984 tons in a long day. This is again a novelty as far as Egypt is concerned.

The Jenks Ship Building Co., of Port Huron, has undoubtedly turned out a very good boat in the steel steamer Capt. Thomas Wilson, their first big freighter. On the first trip she loaded 6,282 gross tons of ore at Ashland for South Chicago. Her draught was a little less than eighteen feet. A report from the steamer on her up trip said that she made the run across Lake Huron from Fort Gratiot Light to Detour, a distance of 225 miles, in seventeen hours, being nearly thirteen and one-half miles per hour, and when on Lake Superior for three and a half hours logged fourteen and one-half miles per hour, with engines turning ninety-four and ninety-five revolutions.

The American Ship Windlass Co. within the past thirty days have received from the American Ship Building Co. on the lakes the following orders for windlasses, capstans and towing machines: 1 No. 9 steam capstan windlass to handle 2-inch chain, 21 No. 8 steam capstan windlasses to handle 1⅞-inch chain, 2 No. 6 steam capstan windlasses to handle 1⅝-inch chain, 10 No. E steam capstans with 6 x 8 inch brass link reversing engines, 11 No. F steam capstans with 7 x 8-inch brass link reversing engines, 2 No. 2 steam towing machines. It is certain that this is quite an endorsement for the "Providence" windlasses, as there are no more intelligent users of machines than on the lakes. The lake vessel owners are wide awake and know just what they are doing about every time.

The Iron Trade Review says this week: A smaller ore movement than that of September is the estimate for October, of those who are keeping close track of shipments. Most of the contracts for ore tonnage expire November 1, and with the majority of shippers the ore movement will be practically ended on that date. Whatever the outcome of the election, it is conceded that ore buying is over for this year, except for the possibility of obtaining odd lots from the docks. There is no object to furnacemen in paying this year's price for ore and selling the iron on the basis of next year's ore prices. Furnaces short on ore will therefore choose to remain idle and await ore shipments of 1901. Further reductions of mining forces on the Gogebic range were made recently, and on the Mesabi range the Duluth mine suspended shipments for the season because of storm damage.

DULUTH—SUPERIOR.

Special Correspondence to The Marine Record.

The steel tow barge Liberty, 1,944 gross and 1,762 net tons, built at West Superior, Wis., and hailing from Duluth, Minn. has been granted official numbers this week by the Bareau of Navigation, Treasury Department, Washington, D. C.

The iron mines of the Lake Superior region are preparing for winter, and have commenced to curtail shipments. It looks as though there would be small shipments of ore eastward during November, and no movement to speak of in December.

The steam yacht Wacouta, owned by James J. Hill, president of the Great Northern Railway Co., is now at the yards of the Eastern Ship Building Co., New London, Conn. She will be laid up for winter and over hauled and a few changes made in the spring.

Since sending that item about shoals at Stannard's Rock and Rocky Island, on Lake Superior, which appeared in last issue of RECORD, I find that I made a slight mistake in direction of Stannard's Rock shoal. It should be almost due west from the light-house instead of about west-south-west.

The coal trade of the head of the lakes has grown to wonderful proportions in the past decade of years. The great advance in the volume of business has come in the past few years. It has been said that Duluth, Chicago and Milwaukee receive and distribute more coal than any other ports in the world.

There are now enrolled at Duluth a total of 283 vessels of all kinds. Gross tonnage, 363,648, as against 192,748 tons a year ago. A majority of the vessels enrolled this year are large steel steamers, the increase for the year of that type of vessel being thirty-four, making a total of sixty-four steel or iron and eighty-nine wooden vessels.

The steel barge Liberty and Loyalty, belonging the International Steamship Co., chiefly controlled by Capt. A. B. Wolvin, will be enrolled at Duluth and the preliminary papers were filed at the customs office this week. The vessels are sister ships and were built in the Superior shipyards this summer. They are 246 feet in length, 42 beam and 21 in depth. Their gross tonnage is 1,944 tons and net 1,762. These vessels are two masted schooners and are designed for the coast trade, possibly between New York and the West Indies. They will go to the seaboard by the way of the "Soo" and the Welland canal and then down the St. Lawrence. They are the full size that can be put through the locks of the Welland canal, and on account of the depth of water at this canal are restricted to a draft of 15 feet. As soon as these two vessels are completed work will commence immediately on two others to be built for D. R. Hanna & Co., of Cleveland and intended for lake traffic. The barge company employs about 425 men.

DETROIT.

Special Correspondence to the Marine Record.

At an auction sale at Port Huron on Monday the tug Lizzie was bid in by C. D. Thompson of Port Huron for $450. The bills against the boat amount to about $900.

Eddy Bros. & Co. is another Michigan lumber firm that has been obliged by the Ontario log law to move their mills over to Georgian Bay. They will erect mills at Blind river.

John Herman, for thirteen years keeper of the Waugoschance light-house, died of heart failure Monday, aged forty-one years. He was unmarried and when off duty made his home with his sister, Mrs. Thomas Gallagher, at Mackinac Island.

The steamer Senator was tied up by the sheriff at Toledo, on Monday, on a claim for $10,000 made by Margaret G. Knapp. William P. Knapp, her husband, fell into the hold and was killed. His wife, as administratrix for the estate, makes the suit. The steamer was bonded.

According to the report of Supervising Inspector of Steam Vessels, Capt. Westcott 1,001,518 passengers arrived at and left the port of Detroit on steamers in August of this year. That surpasses the record for any month in the history of the service, and 123,000 more than in August, 1899.

Contractor Sullivan has begun blasting away the stern of the Fontana. From indications he will not blow up the forward part which lies in sixty feet of water, whereas the "spuds" of his dredge reach down but thirty-two feet. Thus far he has not rescued any of her ore cargo, nor is he likely to.

The Marine Department at Ottawa has decided not to attempt to sink the light-house crib on the Middle ground this fall, owing to the lateness of the season and the danger of losing the structure. It is completed and anchored at Amherstburg, at the mouth of the river, and will be placed next spring.

The new fireboat named the James Battle was successfully launched from the Wyandotte yards of the Detroit Ship Building Co. this week. She is 122 feet in length, 25 feet beam and 13 feet deep, she will be brought here for completion. It is understood that the Battle is one of the best and strongest fireboats afloat.

An unknown fireman on the steamer Huron City committed suicide by jumping overboard Saturday morning. The steamer was then ten miles below the dummy, in Lake Erie. Every effort was made to rescue him, but he sank before aid could reach him. When he shipped at Erie on Friday, he gave the name of "Jim ——." He was about 5 feet 10 inches tall and weighed about 180 pounds.

Probably the most interesting features of canal reports from Sault Ste. Marie regarding Lake Superior commerce are the figures dealing with the coal movement. Hard coal shipments are, of course, less than they were a year ago, on account of the miners' strike. The total to Oct. 1 is only 422,375 net tons against 565,301 tons on Oct. 1 a year ago. September shipments of soft coal were 114,251 tons less than in August, but the aggregate to Oct. 1 is 3,178,113 tons against 2,202, 321 tons on Oct. 1, 1899, and 2,550,452 tons on Oct. 1, 1898.

Dredgers this week while at work removing boulders from the bottom of the Limekiln Crossing brought up a rudder that belonged to the sidewheel steamer E. K. Collins. This steamer burned to the water's edge in the fifties, with a loss of 150 to 200 lives. The rudder found is of the shape used by sidewheelers in those days, has the heavy stock, also a characteristic, and the latter is burned off at the upper end. In spite of its long immersion it was in a fair condition when brought to the surface. That is to say that the timber was quite sound, although of course water-logged.

Because of a misunderstanding of signals, the steamer D. C. Whitney, owned by the Whitney Transportation Co., was recently adjudged by the treasury officials to have violated the navigation laws on the St. Mary's river, and a penalty of $500 was assessed against the company. Acting Secretary Spaulding taking the matter under consideration decided that there was no intention on the part of either the owner or the captain of the vessel to violate any law or rule, and so the penalty was mitigated to $15, and Collector Rich, of Detroit, was so notified by Secretary Spaulding.

Steamer F. E. Spinner was sunk by collision with the steamer H. D. Coffinberry in St. Mary's river on Monday. The crew of the Spinner all escaped. Their boat was bound down, loaded with lumber. Between nine mile point and the dyke, according to Capt. J. H. Madden, the boat Rhodes passed the Spinner, causing the latter to sheer in her course, when the Coffinberry, which was also astern, struck the Spinner on the port side near the bow, crushing in the timbers, Capt. Madden immediately headed his boat for shoal water, and she finally settled to the bottom in seventeen feet of water. The Coffinberry continued on her course, and was apparently uninjured by the collision. The Spinner is owned by David J. Ranson, of Sault Ste. Marie. She was of 777 net tons, and measured 186 feet keel by 35 feet beam. She was built in 1874.

Sir Thomas Lipton will challenge the New York Yacht Club for another series of races for the America's cup. The letter challenging contains a suggestion as to the date of the race, which it is understood will be in August. It is reported that the challenging yacht will be built on the Thames, and she will be named Shamrock.

CHICAGO.

Special Correspondence to The Marine Record.

The Graham & Morton line has discontinued its day schedule and the winter run opens this week with a boat each way.

Grain freights opened the week steady at 1⅝ cents on corn to Buffalo. Charters were made for two outside boats in addition to the business taken by the lines.

Messrs. Frank B. Higgie and William W. Shaw are again at their office in the Rialto building. Both have been away from business for some time on account of illness.

Grain rates went to 1½c. on Wednesday, but not much business was done at the decline, although several boats were on the market for cargoes. Two or three charters were made at that figure to load next week.

The Northern Michigan Transportation Co., which operates the Illinois and City of Charlevoix, desires to build another steel passenger steamer if arrangements to that end can be perfected. The idea is to secure an exact sister ship of the Illinois.

A crib 117 by 30 by 24 feet, ready for anchoring on the east breakwater at Michigan City, broke loose from its moorings on Tuesday and drifted into the mouth of the harbor, blocking two-thirds of the entrance. Wenzell & Stebbins, of Chicago, are the contractors, and their loss will be $6,500.

The new breakwater at Sheboygan has been completed, except the building of the lighthouse at the southern end. The structure will prove of great aid to mariners, and will doubtless result in preventing many wrecks with loss of life. It extends for 600 feet northeast of the harbor piers. The government spent $87,000 in its construction.

The damage of the steamer Tampa, which now occupies the Milwaukee company's stationary drydock was incurred through striking a shoal just outside the harbor at Midland, Ont., for which port she had a cargo of 101,000 bushels of wheat from Chicago at the time. Steam pumps were required to free the steamer of water, and upon discharging the grain it was found that 13,500 bushels had been wet. This was sold to L. H. Clark & Co. of Kingston, Ont. Her docking and repair bill is estimated at $3,000.

The influx of Canadian tonnage shows the condition of Canadian trade on account of the failure of the Manitoba wheat crop. Duluth grain shippers are reporting little business for boats, and are talking of 1¾-cent rates on wheat for the first half of November loading. Some vessel owners are talking of laying up their boats when released from ore contracts, as they believe there will be more money in canceling their insurance than running at present rates and paying high wages to sailors and meeting an abnormally high cost of operating all around.

Capt. J. G. Keith on Saturday presented a bill of $1,400 to the sanitary trustees at Chicago, alleging the sum to be the loss sustained by having the steamer S. S. Curry hung up at the Terminal railroad bridge. President Boldenweck refused to pay the amount, and it is thought the matter will be taken to the courts. The Curry became jammed in the draw of the bridge Sept. 17 and remained eighteen hours, causing one of the worst blobkades of the year. Thirty ships were detained, and a fleet of incoming lumber hookers caused a jam in the south branch that lasted twenty-four hours after the Curry was pulled out of the draw.

Plans are now being made at Washington for two new life-saving stations, one at Chicago and the other at Racine. Supt. Kimball, chief of the life-saving service, says that preparations for the Chicago station are now well advanced, while plans for the new station at Racine are yet in consideration. The Chicago station will be the equal of any other station now represented in the service. The most difficult matter connected with its erection, according to Supt. Kimball, is that of a foundation. Specifications for a stone foundation, to cost $8,000, that will practically amount to a stalwart sea wall, are now being prepared. The site is about a quarter of a mile east of the present station, or in the angle of the south pier and harbor breakwater, bringing out even with the light near that point. Racine's new station will be located between the light-house and the shore in Racine harbor.

The channel between Menominee and Sturgeon Bay will be kept open this winter. The parties to the contract are the Goodrich Transportation Co. and the Mackinac Transportation Co., which owns the three ice crushers which are used to keep the straits to Mackinac open. The Ann Arbor Railway Co. is in with the Goodrich company on the deal. The contract requires that the channel be kept open, and, if necessary, the Mackinac company will have to use its three ice crushers, the Algomah, Sault Ste. Marie and St. Ignace. The two latter are very powerful. The Goodrich company will transfer packages of freight to Sturgeon Bay and will be brought across by the ice crushers. This will give Marinette and Menominee an all-winter route to Chicago and Frankfort, and it is a big thing in a commercial way for the two cities. For several seasons past the Ann Arbor has attempted to maintain a winter route and partly succeeded last winter. This winter it has closed a contract which will compel the Mackinac company to keep the channel open, if at all possible.

Five vessels have been lost with cargoes of iron thus far this season—Halloran, Fontana, Martin, Lyon, Dundee—and all five of them were owned or hailed from Cleveland.

BUFFALO.

Special Correspondence to the Marine Record.

A Buffalo firm has approached the Welland council with a proposal to erect on the Welland canal a factory for wooden tanks and boxes.

William Patton, of Buffalo, has libeled the Lehigh Valley liner Saranac for $20,000 on a claim for damages. Patton claims he was injured on the boat August 23, 1899.

By the decision of Judge Lochran, Minneapolis, the Canadian steamer Arabian is held liable for $10,414 for damages to the schooner Minnedosa by a collision with the locks in the Welland canal in 1895. The Arabian was held liable in the first suit, but the case was sent back by the Court of Appeals on error. The same resuit was obtained in the second trial.

Capt. Donnelly has returned to Toronto after superintending the pumping out of the steamer Tampa, which struck a shoal just outside of Midland harbor, on the way from Chicago to Midland with 101,000 bushels of wheat. The steamer was taken to Milwaukee for repairs. Of the cargo, 13,500 bushels were damaged, and this wheat was sold to L. H. Clarke & Co., Kingston.

Buffalo's coal trade is still to be quoted, but shipments have dwindled to about three cargoes per week. Most of the companies will remain practically idle until the great strike in the anthracite region is settled. For a time the roads confiscated all the hard coal that came this way, but they are now letting it come in, and thus the retail trade of the city is provided for to a certain extent.

The Lake Shore & Michigan Southern Railway will build a steel elevator with a capacity of 750,000 bushels, to cost, it is said, $100,000. The contract for its erection was awarded to the McDonald Engineering Co., of Chicago. The elevator will be situated near the Elk street crossing of the company's tracks. Work will be begun at once and it will be finished by March 1, 1901. Power from Niagara Falls will be used to run the machinery.

The Black Diamond correspondent has found out that all the anthracite shippers have more or less coal, but no one has much, though coal shipments by lake still make a show, the amount aggregating 11,200 tons, distributed as follows: Milwaukee, 5,400 tons; Chicago, 3,000 tons; Waukegan, 2,000 tons, and Sheboygan 800 tons. Freight rates 30 cents except to Waukegan, which was 35 cents. Soft coal is growing scarcer and there is some shortage of cars.

The Tonawanda Associated Boat Owners have won their fight for higher freight rates on lumber shipments by canal from the Tonawanda ports to Albany and New York. The rates now are $1.50 to Albany and $2 to New York. Only a week ago the rates to the above mentioned ports were $1.05 and $1.50 respectively. At those prices the canal boat owners said they were operating their boats at a loss and as a large amount of lumber came in which was to be shipped by canal they decided to ask for an increase.

A dry dock capable of accommodating the largest vessels of the lakes will undoubtedly be provided at Buffalo shortly by the American Ship Building Co., which controls the docks operated by the Buffalo Dry Dock Co. Work on a large dock may, in fact, begin at once. The transfer of Supt. W. W. Waterson from the Lorain works to Buffalo is probably prompted by the improvements contemplated. Of course this will not very much interfere with the works of the Union Dry Dock Co. as they do most of their own repairing and building; at the same time it will open a brisker competition than has ever been known before.

Capt. Charles Maytham, of the Independent Tug Line, is said to have secured the services of Capt. Louis Lautenslager who recently resigned the Buffalo management of the Great Lakes Towing Co. It is understood that Capt. Maytham will install him in the management of a line of tugs at Cleveland, with which he intends fighting the combine. Twenty-five tugs are now being operated by the Maytham line, and the fleet is being steadily added to. Buffalo advices say that Capt. Maytham has not abandoned the plan to build 10 new steel tugs. Capt. Wm. Hall, of Erie, has been appointed manager of the Buffalo branch of the Great Lakes Towing Co., and George Johnson of the old Hand & Johnson line, will assist him.

John Trefts, of Farrar & Trefts, died this week at his home, 735 Delaware avenue. Mr. Trefts had been a resident of Buffalo since 1845, and was one of the foremost figures in the iron working industries of the city. Mr. Trefts came to Buffalo from Pittsburg 55 years ago. He has learned the trade of an iron molder and came here to take charge of the foundry department of the Buffalo Steam Engine Works. When that business was reorganized under the name of George W. Tifft, Sons & Co., Mr. Trefts became a stockholder in the company, and through his skill as an ironworker the Tifft firm was able to carry through a contract in 1860 for the manufacture of the rails for the first street railroad in Buffalo. When oil was discovered near Titusville, Pa., in 1859, Mr. Trefts made the casting for the engine used to pump the first oil well sunk in the Pennsylvania field. A little later he went into oil production on his own account, obtaining some valuable leases and personally superintending the opening of some paying wells. The experience he gained there was valuable to him in the subsequent manufacture of oil well machinery. In 1864 Mr. Trefts formed a partnership with Chillion M. Farrar and Theodore C. Knight, under the style of Farrar, Trefts & Knight, for the establishment of a foundry, machine shop and general iron works. Mr. Knight retired from the firm in 1869, but the remaining partners have carried on the business ever since under the name of Farrar & Trefts, making boilers, steam engines, propeller wheels and other iron articles. The works of the concern now cover over three acres of valuable city property.

KINGSTON ONT.

Special Correspondence to The Marine Record.

According to shippers, Kingston boats have been offered four cents on corn to Montreal from Chicago, but this they have declined, holding that they would rather tie up than do business at that figure.

A Chicago dispatch says: "By the decision of Judge Lochran, at Minneapolis, the Canadian steamer Arabian is held liable for $10,474 damages to the schooner Minnedosa, by a collision in the Welland canal in 1895. The Arabian was held liable in the first suit, but the case was sent back by the Court of Appeals on error. The same result was obtained in the second trial." Detroit owners are puzzled to know what the foregoing means. Two Canadian boats collided in Canadian waters yet a United States judge tries the case and awards damages. The Lake Marine News Association, which sent out the dispatch, wired last night that it did not know why an American judge tried the case but vouched for the truth of the dispatch. Kingston mariners looked up the cause that led to the trial of the action in an American court and found that it was due to the fact that the Montreal Transportation Co., owning the schooner Minnedosa, had accepted the payment of its claim of damages from the underwriters and assigned to them its claim against the steamer Arabian. The Arabian was libeled in American waters and the insurance company prosecuted the action in the American court to recover the insurance paid the Canadian Marine Co.

LETTERS AT DETROIT MARINE POST OFFICE.

October 17, 1900.

To get any of these letters, addressees or their authorized agents will apply at the general delivery window or write to the postmaster at Detroit, calling for "advertised" matter, giving the date of this list and paying one cent.

Advertised matter is previously held one week awaiting delivery. It is held two weeks before it goes to the Dead Letter Office at Washington, D. C.

Brennan, Peter, Bell.
Bowman, Caleb, Tampa.
Bush, Geo.
Byron, Chas.
Benkie, Alf., Monohauset.
Burns, Alf.
Baushaw, Victor, Russell.
Clark, Myrtle, J. L. Green.
Clooner, Michael.
Conlin, L. B.
Corbin, Capt. A.
Crist, Jennie, Quito.
Dixon, John.
Doepole, Al.
Edmunds, Jennie, Columbia.
Flack, Marion.
Farewell, Tom, Parnell.
Foster, Geo., Maia.
Fuller, Jay.
Faller, Carl, Joliet.
Fitzhugh, E. A., Carnegie.
Gilliland, S.
Gallagher, F. P.-3, Alaska.
Goodhead, Albert.
Greening, Geo.
Hill, Harry,-5, Arthur.
Hemens, Giles.
Hosel, Frank.
Hollywood, Chas. A.
Hurley, Geo. T.
Hanan, W. G.
Howard, Harry H.
Hanna, Geo. C.
Higgins, John, Barlum.
Heck, Robert.
Hawkins, Arthur S.-3.
Isaksen, C. O., Delaware.
Jansen, Peter.
Jackson, John.
Jones, John.
Kay, H. W., Nester.
King, Wm., Sparta.
Krautz, Frank, J. E. Owen.
Lewis, Minnie, Our Son.
Lund, C. N., Nester.
Lee, Jas. R., Cadillac.
Leonard, M. A.-2, L. S. Porter.
Loughlin, James.
Leach, Verne, Iroquois.
Lynch, Owen.
Meddaugh, Ben, Ira Owen.
May, Daniel,-2, Knapp.
Mansan, Walter.
Murch, Frank, J. W. Moore.
Makron, Maime.
Melerum, Henry.
Mornan, Jno.
Mallette, J.-2, Whitbeck.
Merritt, Lula, Cuba.
Miller, O. A., Whitbeck.
Mulligan, Jno., Lockwood.
MacLeod, Neil,-2, Kaliyuga.
McKinnon, J. D., J. J. Hill.
McDonald, Dan.
Nelson, Olaf, J. I. Case.
Nelson, Chas.
Odette, Chas.
Poquette, J. A., Kaliyuga.
Pelo, Jos.
Pogreter, J. W.
Pullen, C. S., Green.
Papholz, J. J., J. E. Owen.
Rogerson, James,-2
Read, Wm. W.
Rigby, J. A.
Sullivan, Herbert.
Sheehan, John.
Stone, Geo.
Schrepperman, Jno.
Scaiber, Wm.
Shaw, Wm., Lehigh.
Schratz, Edith J.
Snyder, Chas. A., McDougall.
Salifske, Fred.-2, Palmer.
Thompson, Chas., Eads.
Thompson, J. B.-2, LaSalle.
Tobin, Thos.
Turner, Chas.
Whitton, Geo., Our Son.
Wohdel, Walter.
Warner, Louis,

F. B. DICKERSON, P. M.

THE new twenty story office building which is being erected at the corner of Broad street and Exchange place, New York city, and which will be known as the Broad & Exchange, is to be thoroughly up-to-date in every feature of its construction and furnishing. It will be equipped throughout with the Kenney flushometer, manufactured solely by the Kenney Co., New York, which system has been adopted on account of its superiority as a fitting sanitary device for this largest of all office buildings ever erected. The general contractors are the Geo. A. Fuller Co., of New York and Chicago, and the plumbing will be done by Mr. T. J. Byrne of New York.

INTERNATIONAL MARITIME LAW.

CONFERENCE AT PARIS ON LIABILITY OF OWNERS AND SALVAGE.

The International Maritime Conference meets at Paris early this month. The questions to be considered at the conference are: First, the limited liability of shipowners. Second, the rendering of assistance at sea, with which is involved that of salvage and the obligation of standing by after collision. Third, the question of jurisdiction in collision cases. The British and American committees are of the opinion that the principle of limited liability should cover cases where damage has been done to dykes, quays and similar fixed objects, thus recognizing the soundness of the principle embodied in Mr. McArthur's act passed by the British Parliament in the session just closed. Both agree that the limitation should not cover the owner's liability for the wages of master and crew. But the other sub-head of inquiry, which refers to the case of the master not executing the engagements undertaken by the shipowner, or by himself on the shipowner's behalf, is found to be a little too complex to answer off-hand. The British idea is that the limited liability principle should be admitted in cases where, without the default of the shipowner himself, the engagement is broken by the negligence of the master or crew. The Americans seem to agree to this view of their British colleagues, but they would also extend the principle to the case of maritime torts as well as to that of such maritime contracts as have been indicated. Both British and Americans would give jurisdiction to the courts of the country where the colliding vessel may be found, or where the owner can be served with process. But the Americans suggest that where both parties are non-residents it should be allowable to decline jurisdiction, whilst the British delegates urge that any question of competence in the court should be interpreted in the manner most conducive to the exercise of jurisdiction. All except the United States are of opinion that a uniform law of salvage for all maritime countries should be reached. The reason which the United States puts forward for its view is that already the laws are so nearly in accord that it is not worth while to disturb them.—Journal of Commerce.

EASTERN FREIGHT REPORT.

Messrs. Funch, Edye & Co., New York, report the condition of the eastern freight market as follows:

"The declining tendency in freights referred to in our last report has, unfortunately, continued and, in view of the very light enquiry for grain tonnage and the total cessation of demand from the Atlantic cotton ports, prospects do not look encouraging for the re-establishment of a higher range of freights in the near future. The decline in parcel freights at the South Atlantic ports has equally affected the rates at New Orleans, whilst the return to normal conditions as an export centre on the part of Galveston, appears to be of slower development than anticipated, and prevents charterers there from fresh commitments. In time charters two of the three fixtures reported for long terms, have been effected by timber shippers from the Gulf, and in their duration do not reflect the position of time charterers for general purposes, who will commit themselves for the briefest possible period only. In addition to the charters reported for coal, we may mention considerable enquiry for room, evidently for the purpose of covering sales of coal already made, and the shipment of which is held back in the hope of coming in at a lower level of freights. These shipments may therefore be justly looked upon as a guarantee against any decided slump in our freight market, such as the absence of demand for other staples, above referred to, might otherwise readily produce.

The condition of our market for sailing vessels has undergone no change since our last. The supply of tonnage remains as light as ever and rates continue firm, with transactions reduced to a minimum.

SPEAKING of the Nicaragua canal scheme, President McKinley in his letter of acceptance of nomination, said: The construction of a maritime canal is now more than ever indispensable to that intimate and ready communication between our eastern and western seaports demanded by the annexation of the Hawaiian Islands and the expansion of our influence and trade in the Pacific. Our national policy more imperatively than ever calls for its completion and control by this government; and it is believed that the next session of Congress, after receiving the full report of the commission appointed under the act approved March 3, 1899, will make provisions for the sure accomplishment of this great work.

LITERARY NOTES.

The Journal of the Western Society of Engineers for August contains a paper on Reservoirs, and the control of the Lower Mississippi, which is followed by a written discussion, by L. E. Cooley, C. H. Tutton, R. E. McMath, I. Randolph and T. T. Johnston. This subject is one of the most interesting engineering problems on the continent.

In a second edition, issued Sept. 15, 1900, of the supplement to the Iron and Steel Directory, the American Iron and Steel association, 261 South Fourth street, Philadelphia, Pa., presents to the trade a more complete list of the iron and steel consolidations effected in the United States since Jan. 1, 1898. The list is limited, however, to those concerns that embrace the ownership of blast furnaces, rolling mills, steel mills, tin plate works, and auxiliary industries, including shipbuilding and bridge building works. As it is announced that a new edition of the Directory itself will not be printed this year, the supplement will prove indispensable in its way. Address James M. Swank, general manager.

In an instructive illustrated pamphlet on the "Wood Pulp of Canada," compiled by George Johnson, Dominion statistician, an estimate is given of the available supply of pulp wood in this country. It is calculated that there are 450,000,000 acres of spruce wood in Canada, and taking 10 tons of ground pulp as a product per acre we have 4,500,000,000 tons of pulp in sight. In the province of Quebec alone it is estimated that there are 200,000,000 acres of wood land mostly timbered with black spruce, the most valuable of all woods for pulp and paper. Then the water powers as yet unutilized, and without which the manufacture of pulp and paper would be much handicapped, are enormous in the very regions where spruce most abounds. Canada is the premier land for spruce and paper.

With its November issue, The Century Magazine begins a Year of Romance, during which many of the most famous living writers of fiction will contribute to the magazine short stories, novels or novelettes. The reception accorded "The Helmet of Navarre," begun in the August number, indicates that the proposed departure will be a popular one, and with such names to conjure with as Rudyard Kipling, Mrs. Burnett, Bret Harte, Lew Wallace, Weir Mitchell, Miss Wilkens, Winston Churchill, Howells, James, Harris, Cable, Stockton, Page, Anstey and Ian Maclaren—to note but these few—the conductors of The Century are pretty sure to meet the tasts of all lovers of fiction. The Century means to make its November and December numbers the most beautiful issues ever published. Color printing will be largely used.

Cassier's Magazine has in its list of September articles five which are particularly noteworthy contributions to engineering literature. One of these is devoted to "American Ore Dock Machinery," by Aurthur C. Johnston, in which a comprehensive account is given of the remarkable equipments for handling bulk cargoes of coal and iron which have been developed on the great American lakes. The article is profusely illustrated, and affords an admirable idea of one feature of American commercial methods, namely, the building of special tools for special work. Another article entitled "Electricity in large in Cities," has been contributed by W. S. Barstow. "Sugar Engineering in Cuba" is discussed by E. Sherman Gould. Mr. Benjamin Taylor contributes an article entitled "The World's Coal," in which the facts and features of the problem of present and future supplies are ably presented.

The Statistical Year Book for 1899 has been issued by the Department of Agriculture from the Government Printing Bureau, Ottawa. Facts and statistics regarding the Government and constitution of Canada, its resources in agriculture fisheries, minerals and manufactures, its commerce, its public works, its financial, insurance and other commercial institutions; statistics of education, population, temperance, mortality, etc., are embodied in such a compact form as to make the work more useful than ever before. George Johnson, the Government's chief statistician, is a man born for his work. He knows by instinct just what new information is most valued, and how to present the developments of the country in an instructive way. He has the rare gift of making figures interesting; and the admirable order and system of his work enables him to instant use of a vast mass of material, formerly "without form and void." Mr. Johnson is in fact the creator of a ready reference information department which is probably unequalled by any Government institution of the kind in the world.

THE Lake Ontario and Bay of Quinte Navigation Co, will build another steamer this winter.

REPORTED BY THE LOOKOUT.

The Montreal Transportation Co. will build a large barge and also a river tug.

A steamboat is to be built this fall at Sand Point, for the use of the Upper Ottawa Forwarding Co.

George J. Gould, it is reported, will have a large twin-screw steam yacht built in the United States.

R. Davis, Kingston, Ont., is preparing plans for a 45-foot steam yacht, to be built this winter for a Buffalo man. The yacht will cost $3,000.

The Ship Building, Dry Dock and Wrecking Co., of Collingwood, Ont., has changed its firm name to the Collingwood Ship Building Co., Ltd.

The Donnelly Wrecking & Salvage Co., Kingston, Ont., have succeeded in raising the schooner Volunteer, which sunk some time ago at Belleville, Ont.

The canal boat Stetson which foundered in Lake Ontario during a heavy storm, has been purchased by Capt. Ira B. Folger and taken to Kingston, Ontario.

It is said that the Canadian Northern will have two steel passenger boats built this winter to ply between Port Arthur and the lower lake ports. They are to be equipped with the most modern machinery and have a speed of 18 to 20 miles an hour.

The Chesapeake and Ohio Railway recently secured the entire stock of the Coastwise Steamship Co., engaged in shipping coal from Newport News to New England ports. It owns three ocean tugs, fifteen large coal barges and charters three ocean steamers.

The Conner's syndicate, who have made a start on the grain elevators at Montreal, propose to build a number of barges and steamers for their carrying trade on the lakes. The Swan & Hunter Ship Building Co., Wallsend-on-Tyne, England, may get the contract.

The Newport News Ship Building and Dry Dock Co. has been awarded the contract by the North German Lloyd Co. for rebuilding the large steamship Maine, recently burned in the disastrous dock conflagration at Hoboken. It will take about one year to complete the repairs.

The new steamer built at Rat Portage, Ont., for the Rainy River Navigation Co., will be launched in a few days. It has been built for passenger as well as freight service, being fitted up with twenty-two state rooms, and will be the first flat bottomed steamer to ply on Rainy river for some years.

Col. Wm. P. Anderson, well known to vesselmen as chief engineer of the Canadian Department of Marine and Fisheries, has been carrying off honors at rifle shooting lately. He recently won the Governor-General's prize of $200, and a gold medal, which makes him the champion rifle shot of Canada for this year.

The steamer St. Andrew was wrecked last month on Blanchard Island, near Black Bay, 40 miles from Port Arthur, owing to the deflection of the steamer's compass from lying near beds of magnetic iron. The St. Andrew was owned by Playfair & Co., of Midland, Ont., and Capt. Featherstonhaugh, of Hamilton, Ont., the latter being in command.

Owing partly to the scarcity of Nova Scotia coal in Halifax an order for 2,000 tons of steam coal has been placed in Virginia for the use of British warships making their headquarters in Halifax. The partial failure of the supply of coal from Wales for the navy has also caused the admiralty to direct experiments to be made with other coal. The result of the test of Virginia coal will be reported to the imperial government.

Six steamships recently sailed from Norfolk, Va., carrying 25,000 tons of coal. The Spanish steamship Begona took a full cargo of coal for the island of Manila, the Italian steamship Citta de Messinia took a full cargo for Messinia, the Italian steamship Balta a cargo for Naples, the British steamship Strathord one for Nagasaki, the British steamship King Frederick one for Tampico, a British steamship one for Kingston, Jamaica, and the Norwegian steamship Fri took one for Halifax.

President Charles H. Cramp, of the Cramp Ship and Engine Building Co., received from Vice Admiral Verhovskoy, head of the Department of Construction and Supply of the Imperial Russian navy, the following cablegram, in reply to a report of the result of the trial of the cruiser Variag: "Thanks for joyful announcement. Extremely happy that the eminent Cramps' shipyard has displayed to navies of the world a new brilliant success. I heartily desire that you may keep your good health a long time yet, for the glory of your works and your name, continuing to hold high your professional traditions."

The New York Marine Journal in speaking about Superintending Engineer Geo. V. Sloat, giving his seven months' experience in 1850 on a trip between New York and San Francisco in the old Morgan Line side-wheel steamboat New Orleans says: After encountering a severe gale which took off her pilothouse and made splinters of some of her joiner work this vessel put into St. Thomas, made repairs there, and then continued, stopping at various ports of South America. In the Straits of Magellan the crew were obliged to cut wood for fuel to carry them to Valparaiso, in snow two feet deep. It may occur to our contemporary that traveling from Magellan to Valparaiso in snow two feet deep was rather peculiar navigation even for an old Morgan Line side-wheeler.

LATITUDE AND LONGITUDE BY THE GREATEST ALTITUDE, AND BY EQUAL ALTITUDES OF A HEAVENLY BODY.

(Continued from last issue.)

The practical application of the preceding method of finding latitude and longitude by the greatest altitude and by equal altitudes near the meridian is as follows:

Take an altitude of an object within about one hour East of the meridian and note the time by watch; repeat the observation when the object is West of the meridian at the same altitude and also note the time. The difference of the observed time by watch for the two altitudes equals the elapsed time and half of it equals T when the object is the sun. But for any other object the elapsed time has to be converted into moon time, planet time or star time, as the case may be, and half of the converted time equals T. In such a case the rate of speed also has to be determined with regard to the converted time. The latter equals elapsed time plus change of the mean sun's right ascension during the interval between observations, minus change of the right ascension of the object during the interval between observations. Half the sum of the observed times indicates the time by watch when the greatest altitude occurs for which time make out the latitude by account.

A. Reckoning for the time of the greatest altitude.

a, latitude by equal altitudes.

With the latitude by account for the middle of the elapsed time and the declination find p by formula (1).

Divide the rate of speed by 60 which equals e.

With the true course made good counted from North or South and e find g by formula (4) upper sign for Westerly, lower sign for Easterly courses.

Find y by formula (9) and y by formula (11) and both results add to the observed true altitude which gives the greatest altitude reduced to the meridian; with which proceed as usual.

Repetition of the reckoning required in regard to p when the latitude found differs much from the latitude by account.

b. Latitude by the greatest altitude.

Find y by formula (11) and add it to the greatest true altitude, the sum is the altitude reduced to the meridian, with which proceed as usual.

c. Longitude by equal altitudes and by the greatest altitude.

Compute the hour angle s by formula 12; upper sign when the latitude increases, lower sign when the latitude decreases, and find by it the time aboard ship in the usual manner. The difference between ships' time and Greenwich time at the moment the greatest altitude occurred or was taken is the longitude in time; as this moment is not exactly known when only the greatest altitude is observed, it requires always the observations of two additional equal altitudes to find from the time noted for them the exact moment. The hour angle of the greatest altitude is the same as before.

B. Reckoning for the time of the meridian passage of the object.

a, latitude by equal altitudes.

Proceed as under Aa. Find y by formula (9) and subtract from it y by formula (11) to the rest add the observed true altitude, the sum is the real meridian altitude from which the latitude is found in the old way.

b. Latitude by the greatest altitude.

Find y by formula (11) and subtract it from the greatest true altitude, the rest is the real meridian altitude from which the latitude is found in the usual way.

c. Longitude by equal altitudes and by the greatest altitude.

Compute the hour angle s by formula (13); upper sign when the latitude increases, lower sign when the latitude decreases; and apply it, with sign reversed, to the time of the greatest altitude by watch which gives the time of the object's transit by watch in case of the sun. But for any other object the product of hour angle and elapsed time, divided by the converted time, is to be applied as before. Find the meridian passage of the object in the usual way and compare the time with Greenwich time by chronometer at the object's transit, the difference is the longitude in time. The time of the greatest altitude and of the meridian passage of the object by watch is necessary to fix the moment or place for which latitude and longitude is found for immediate or future reference.

The method under B, as regards latitude, is simpler than under A and brings the reckoning right up to the meridian passage of the object; in case of the sun up to apparent noon, which is of some advantage. But in regard to time, the method under A is preferable.

An illustration of the reckoning is given by the following example.

Example: In 60° and 62° N. latitude by account, true equal altitudes of the sun were found 17° 45′ 43″, true course in the interval N. 30° E.; rate of speed 75.7 miles per hour; time between observations 1h. 49m. 49.4s. Declination 10° S., find latitude and ship's time for the middle of the elapsed time.

According to the formulæ mentioned above we have latitude by account at the middle of observations 61° 0′ N., which, with the declination of 10° 0′ gives p = 60.52; the rate of speed per minute e = 1.2617; e sin 30 = 0.63085; e cos 30° = 1.0927; T = 54.912 minutes.

Hence by formula (4) $g = 1 + \frac{0.63085}{15 \cos 61°} = 1.08675$

$$\frac{(T\,g)^2}{p} = \frac{(54.912 \quad 1.08675)^2}{60.52} = 58.84'$$

$$\frac{p}{4}\,(e \cos n)^2 = 15.13 \quad 1.0927^2 = 18.07'$$

Observed true altitude	17°45.72′
Greatest altitude reduced to mer.	19° 2 63′
Mer. Zen. Dist.	70°57.37′ N.
Declination.	10° 0.co′ S.
Lat. in	60°57.37′ N.

Hourangle of greatest altitude =

$$-\frac{p\,e \cos n}{2} = -\frac{60.52 \quad 1.c927}{2} = 33.07 \text{ m. East.}$$

subtracted from 24h 0.00

Apparent time at ship 23h 26.93 m.

By the method in use we have:

Half elapsed time oh. 54m. 54.5s. =

13° 43′ 38″ cos 9.987414

Decl. 10 o o cot. 0.753681 cosec 0.760330

10 17 16 cot. 0.741095 sin 9.251862

17° 45′ 43″ sin 9.484389

71 42 53 cos 9.496581

61 25 37 N. lat. in

oh. om. os. apparant time at ship.

Comparing the results the latitude by the method in use is 61° 25 62—60° 57.37′ = 28.25′ in error, and the time 33.07 m., equal to an error in longitude of 8° 16′, showing vividly the utter worthlessness of the method in use.

The prevailing practice of taking half the elapsed time as hour angle with which to compute the latitude, results in obtaining anything but the correct latitude. The greater error, however, is committed by taking the middle of the observed time for the moment of transit of object, a favorite practice with some navigators, and advocated by pseudo teachers, rendering the longitude as much in error as the hour angle of the greatest altitude amounts to, in many instances several degrees. The following table shows this error in time minutes.

TABLE 2.

Showing in time minutes the hour angle of the greatest altitude on account of a change in latitude, and also the reduction to the meridian in arc minutes when the declination of the object is 23° 30′, and its name different from that of the latitude.

Latitude. Degrees	Hour angles in time minutes. Change in latitude per hour, miles. 10	20	30	40	Reduction in arc minutes. Change in latitude per hour, miles. 40	30	20	10	Latitude. Degrees
10	1.56	3.11	4.67	6.23	2.08	1.17	0.52	0.13	10
20	2.03	4 07	6.10	8.14	2.71	1.53	0.68	0.17	20
30	2.58	5.15	7.73	10.31	3.44	1.93	0.86	0.22	30
40	3 24	6.49	9.73	13 98	4 33	2.43	1.08	o 27	40
50	4.14	8.28	12.43	16.57	5.52	3.11	1.38	0.35	50
60	5.52	11.04	16.55	22.07	7.36	4.14	1.84	0.46	60
70	8.10	16 21	24.31	32.42	10.81	6.08	2.70	0.68	70
80	15.55	31.10	46.65	62.20	20.73	11.66	5.18	1.30	80

According to the preceding table a vessel in 60 degrees N. latitude changing the latter at the rate of 20 miles an hour, the declination being 23° 30′ S., will find the hour angle of the greatest altitude 11.04 minutes = 2.76 degrees and the reduction to the meridian 1.84 minutes. Neglecting these quantities, the latitude will be nearly two minutes in error and the longitude 2° 46′. In general the error in longitude increases as the speed, and in latitude as the square of speed.

When the declination also changes during observation, errors on account of neglecting corrections are sometimes considerably increased. A change of the declination acts either in conjunction with or in opposition to the change in latitude. A change of the declination in an opposite direction to the change in latitude acts in conjunction with it, and a change in the same direction acts in opposition to it. In the former case the sum of both changes has to be taken into account; in the latter case their difference.

As the change in the declination of the moon is sometimes 17 minutes per hour, when acting in conjunction with a change in latitude of 10 miles per hour, acts as if the change in latitude were 27 miles; a change in latitude of 20 miles under the same conditions would act like a change of 37 miles, etc.

Taking 10 degrees as a mean value of the declination and its change 17 minutes per hour, the following table shows the hour angle of the greatest altitude and the reduction to the meridian.

TABLE 3.

Showing in time minutes the hour angle of the greatest altitude on account of a change in latitude, and also the reduction to the meridian in arc minutes, when the declination of the object is 10 degrees, its name different from that of the latitude, and the change of the declination 17 minutes per hour.

Latitude. Degrees	Hour angles in time minutes. Change in latitude per hour, miles. 10	20	30	40	Reduction in arc minutes. Change in latitude per hour, miles. 40	30	20	10	Latitude. Degrees
10	4.20	5.76	7.32	8.87	2.43	1.65	1 03	0.55	10
20	5.49	7.53	9.56	11.59	3 73	2.53	1.57	0.84	20
30	6.96	9 54	12.11	14.69	5.20	3.53	2.19	1.17	30
40	8.76	12.00	15.25	18.49	7.00	4.76	2.95	1.57	40
50	11.18	15.33	19.47	23.61	9.43	6.41	3 97	2.12	50
60	14 90	20.42	25.94	31.45	13.16	8.95	5.54	2.95	60
70	21.88	29 98	38.09	46.19	20.16	13.71	8.49	4.52	70
80	41.98	57.53	73.08	88.63	40.32	27.41	16.99	9 05	80

According to the preceding table, in 60° N. latitude, the latter increasing at the rate of 20 miles an hour, the declination being 10° S. and increasing at the rate of 17′ per hour, a vessel will find the hour angle of the greatest altitude 20.42 minutes equal 5.11 degrees, and the reduction to the meridian 5.54 minutes. By neglecting these corrections as is always the case, latitude will be about 5 minutes in error and longitude 5 degrees; sufficient cause to bring any vessel on the strand.

JOHN MAURICE.
Civil Engineer and Nautical Expert.

Chicago, Sept. 1900.

VISIBLE SUPPLY OF GRAIN.

As compiled for THE MARINE RECORD, by George F. Stone, Secretary Chicago Board of Trade.

CITIES WHERE STORED.	WHEAT. Bushels.	CORN. Bushels.	OATS. Bushels.	RYE. Bushels.	BARLEY Bushels.
Buffalo	3,744.000	374,000	280,000	4,000	443,000
Chicago	13,372.000	2,680,000	3,971,000	515,000	11,000
Detroit	396.000	40.000	151,000	84,000	3,000
Duluth	6,714.000	86,000	25,000	54.000	479,000
Fort William, Ont.	780.000				
Milwaukee	712.000	160,000	298,000	1,000	47,000
Port Arthur, Ont.	94.000				
Toledo	1,286,000	319.000	1,457,000	24,000	2,000
Toronto	44,000		15 000		115,000
On Canals	398,000	482,000	112,000	35 000	60,000
On Lakes	1,074,000	3,266,000	281.000	93,000	738,000
On Miss. River					
Grand Total	56,978,000	9.829.000	12,235 000	986,000	2 348,000
Corresponding Date, 1899	47,314,000	15,065.000	7,069,000	819,000	2,102,000
Increase	1,577,000	1,942,000	216,000	51,000	422,000
Decrease					

While the stock of grain at lake ports only is here given, the total shows the figures for the entire country except the Pacific Slope.

ACCORDING to the Bureau of Statistics the iron and steel trade with foreign countries covering the last twenty years, our position has been reversed. Within the last five years we have actually changed from an importing to an exporting nation. In 1880 we imported five times as much in value as we exported, of iron and steel products. Now we export six times the value of our iron and steel imports. These exports in 1900 aggregated $121,858,341, thus ranking next to breadstuffs, cotton and provisions, the three higher in value. There are in the iron and steel exports twenty-one classes, valued at from $1,000,000 to $9,000,000 each.

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CLEVELAND, O., OCTOBER 18, 1900.

A WELL CONTESTED COLLISION CASE.

The steamers Livingstone and Grand Traverse came into collision in Lake Erie in October, 1896, and the Grand Traverse with her cargo, was totally lost, while the former ship sustained upwards of $7,000 damage. The Lackawanna Transportation Co., as owner, and the Delaware, Lackawanna & Western Railroad Co., as charterer of the Grand Traverse, at once libeled the Livingstone in Buffalo for $65,000 damages. Then the cargo insurers joined in the suit, claiming $5,000 or $6,000 more. The Livingstone was promptly bonded and the suit finally tried in Ithaca, N. Y., before United States Judge Coxe, of the northern district of New York.

It is somewhat unusual to hear admiralty cases in Ithaca, but Judge Coxe is a lecturer in Cornell University and wishes to give his students the benefit of attending the actual trial of such a suit. He found both steamers to have been in fault, much to the dissatisfaction of the owners of the Grand Traverse. The case was then referred to a United States commissioner in Buffalo to ascertain the damages. He filed his report in January, 1900, and as it charged the Livingstone with the whole of the cargo damage, her owners took an appeal.

This was recently argued in the new admiralty court for the western district of New York before Judge Hazel. He has just filed a careful opinion which fully sustains the Livingstone's position, holding that in cases of collision due to mutual fault the cargo if owned by those operating the sunken ship, can only recover half its loss from the other boat; if owned by innocent strangers it may collect its entire value from the surviving ship, but this, in turn, is entitled to charge back one-half of such amount against whatever balance may be charged against it on account of the loss of the sunken ship. The loss of the Grand Traverse is fixed at $37,500 and her cargo at about $5,000, or $42,500 in all. The Livingstone's damage is found to have been about $7,500.

According to the admiralty rule of division of loss one half of the difference between these two amounts, or with interest about $20,000, will be in round numbers the amount of the decree against the Livingstone, and against which, with the expenses of the litigation, her underwriters protect her. The owners of the Grand Traverse propose to appeal the case to the court of appeals, sitting in New York city. H. D. Goulder, Esq., was counsel for the Grand Traverse; F. H. Canfield, Esq., for the Livingstone; C. E. Kremer, Esq., for the underwriters, and W. B. Cady, Esq., for the cargo of the Grand Traverse.

A NEW ERA IN AMERICAN SHIPS.

American shipbuilding has passed through many discouraging periods of evolution, and the height of its remarkable development in the middle half of the present century can hardly be measured by the period of stagnation that has fallen upon it for the past two decades. Of this latter we have had enough, and no fruits of our war in Cuba and the Orient are better appreciated as a whole than the new interests that have been stimulated in shipbuilding circles. A part of the present activity in the shipping interest is due to the general prosperity of the country and the withdrawal of some ships from the paths of commerce for war purposes; but, after due allowances are made for these, the fact remains that the American shipbuilding industry is entering upon a new era that may carry it to the high water mark of half a century ago. Abundant and indubitable facts point toward the promising future of American shipbuilding of war vessels, ocean steamers, yachts and coasting vessels.

There are certain tendencies in this new movement that show the changes in the commercial needs of the country. The day of the small vessel has nearly passed, and those from 4,000 tons up are the universal favorites. A vessel of this size can be handled with the same number of men as required for one of half the tonnage, and its earning capacity is thereby materially increased. Hand in hand with the growth of larger vessels of enormous carrying capacity will go the reduction in speed. The fast vessels, which are built primarily to carry passengers and the mails, and incidentally to break records, are not profitable investments. They do not pay whether flying under the American or British flag, unless heavily subsidized. There is sentiment in the thought of owning these handsome greyhounds of the ocean, but they are costly luxuries and their number will be limited. On the Pacific, where trade with the Orient is to develop, the new vessels will all be of large size and immense carrying capacity, and of comparatively slow speed. It is promised that over twenty-five of these large steamers will be engaged in the Oriental trade with our Pacific coast within the next five years. Every shipyard on the Atlantic and Pacific to-day is busy, and it is impossible to place new contracts for a vessel anywhere in this country. Within the next six months a large fleet of ocean steamers, coasters, wooden ships and warships will be launched.

This is not a matter of guesswork or of prophecy, but is an actual fact, based on the returns of the different shipbuilding plants and the investigations of the Commissioner of Navigation. Our own new navy furnishes considerable work for the plants, and the agitation for keeping one ship in the process of construction, in each of the important navy yards all the time, is likely to meet with a favorable outcome. There are fifty war vessels, of an aggregate displacement of 140,813 tons, in the course of construction or under contract in the various seacoast shipyards, and, besides these, Congress has authorized six other warships, of 76,500 tons displacement, the contracts for which have not yet been let. These warships run all the way from the small torpedo boats up to the magnificent battle ships of the Kentucky and Kearsarge type. The growing needs of our navy tend to stimulate competition in the construction of vessels of every type, for, after the ship-building plant is once thoroughly equipped, it can accept orders for widely different types of vessels. It may be said that our new navy consequently gave the first incentive to the present movement in American ship building and induced builders to equip large and expensive plants at favorable points along the two coasts. Otherwise the present demand for American ships could not have been met in even a partially successful way. On the Pacific coast, the large steamers in the course of construction represent an immense tonnage in the aggregate. For the Hawaiian trade alone there are four steamers on the stocks with an aggregate gross tonnage of 26,500. The Pacific Mail Steamship Co. has two large steamers partly finished, and The International Navigation Co. has two more, while the Oceanic Steamship Co. (Spreckles), have three building. On the Atlantic coast there are three large steamers in the yards for the Cuban trade. These ten steamers represent over 81,000 gross tons, and they do not include the new coasting traders.

There are over forty-five vessels of the latter class in course of construction or under contract in this country, and as their gross total tonnage is over 75,000, their average size must be decidedly larger than the average coaster built in former days. In this list are included some small vessels of not much more than local importance, and their small size increases the average capacity for the larger number of big ships. The large four and five-masted sailing vessels are in great demand, and one at least is being built of 5,500 tons and with six masts.

The rates for ocean freight are higher by 25 per cent. to-day than they were a year ago, and the cost of construction has advanced proprotionately because of the higher cost of lumber and structural iron and steel. These two offsetting factors do not seem to influence the course of the trade to any appreciable extent, and, from present indications, we may look for new fleets of American ships on the water by next summer, while others will take their places on the stocks of a score of different Atlantic and Pacific shipyards. Those who have the interest and glory of the American flag on the high seas at heart will find these harbingers for a new era of American ship building good reasons for being satisfied at the course of history in the past two years.—George E. Walsh, in Science and Industry.

SOCIETY OF NAVAL ARCHITECTS.

List of papers to be read before the Society of Naval Architects and Marine Engineers, at its eighth annual meeting, Thursday, November 15, 1900:

Capacity Test of a Unique Form of Air Pump, by F. Meriam Wheeler, Esq., member.

Interchangeability of Units for Marine Work, by W. D. Forbes, Esq., member.

The United States Experimental Model Basin, by Naval Constructor D. W. Taylor, U. S. N., member.

The Composition and Classification of Paints and Varnishes, by Prof. A. H. Sabin.

Tests of the Electric Plants of the Battleships Kearsarge and Kentucky, by Naval Constructor J. J. Woodward, U. S. N., member.

Coaling of the U. S. S. Massachusetts at Sea, by Spencer Miller, Esq., associate.

Notes on Recent Improvements in Foreign Shipbuilding Plants, by Assistant Naval Constructor H. G. Gillmor, U. S. N., member.

Can the American Shipbuilder under Present Conditions Compete with the British and German Shipbuilders in the Production of the Largest Class of Ocean Passenger and Freight Steamships? By Geo. W. Dickie, Esq., member of council.

Classification Rules, by Theodore Lucas, Esq., member.

Recent Designs of Battleships and Cruisers for the U. S. Navy, by Chief Constructor Philip Hichborn, U. S. N., vice-president.

A Comparison of the Contract Prices of our Naval Vessels, by Harrison S. Taft, Esq., associate.

Launch of a Cruiser and a Battleship, by James Dickie, Esq., member.

The Safety of Torpedo Boats at Sea and in Action under Various Conditions, by Naval Constructor Lloyd Bankson, U. S. N., member.

HARNESSING THE SEA.

Many persons assume lightly that the force of the tides and ocean waves will be utilized some day so as to enable us to dispense with coal. But the outlook for this is not very promising. Numerous wave motors and tide-power schemes have been invented, but none have produced good practical results. Wave motors have, it is true, been used for light pumping, but they are still to be classed as toys. Tide-power is much overestimated. The disappointment of those who have experimented with it has come of their neglect to figure out how much water and how much fall are required to produce a horse-power. A horse-power for a day of ten hours, for example, would require something like 120 tons of water falling from a height of 100 feet, so that a 500 horse power factory, say, would need 60,000 ton of water at a 100-foot head. On the basis of 36 cubic feet of water to the ton, there would thus be over 2,000,000 cubic feet of water and this would make a fair-sized pond, say, about 1,000 feet long, 200 feet wide and 10 feet deep. There is in these few figures something that may help to open the eyes of the tide-power plan inventor and of those who are in the habit of putting money into such things.—Ex.

VESSELS CLASSED.

Vessels classed and rated this week by the American Bureau of Shipping in the Record of American and Foreign Shipping: American screw Sierra, owned by the Oceanic Steamship Co.; schooner Edward T. Stolesbury; three-masted schooner W. R. Perkins; British schooner G. S. Tropp; and British half-brig J. S. Bennett.

THE ORE MARKET.

According to the American Manufacturer the movement of wild ore is exceedingly light now, those boats getting only that amount of tonnage which the shipment to the ports at the head of the lakes exceeds the demands of the contract tonnage. The rate generally accepted is 65 cents. In making their calculations on the amount of business that is to be done on the lakes next year, and the rates that are to be obtainable for carrying ore and the other commodities, both the vesselmen and the shippers are taking account of the new feature that is likely to be produced by the brown hemitate ore from the Michipicoten district being placed on the market. The tariff on this ore is likely to prevent it from having any great effect upon the prices that are to be obtainable for ores from the States, but on this account the Canadian shippers will join with those on this side of the line in demanding a lower rate of freight. It has been practically demonstrated that Canada cannot possibly use all of this wealth of ore, or as much of it as can be mined in a season, her pig iron industry being yet in its infancy, and her steel trade as well. With nine furnaces in existence, a better part of the last year was spent with four or five of them out of blast. The supply of ore in Canada has been sufficient to keep the furnaces going, so that unless the furnace capacity is increased, and the demand for finished material enlarged, the brown hematite ore from the Michipicoten district must seek a market in the States or flood the Canadian market and push the prices down. The statement now being made is that this ore is to be shipped into the States, as Mr. Clergue, who heads the movement to develop that field, comes from this side of the line and is better acquainted with the needs and the conditions here than he is in Canada. This rush of ore is likely to cause a flurry on the American market before another year is out, especially if the Algoma railroad gets into operation to the lake soon, and the promoters continue to develop that field as they have started.

The figures on the ore shipment for the last month and up to the present date from the first of the year, have just been made out by those who are watching the situation with a good deal of interest. The figures show that during the month of September the vessels, both contract and wild, brought down from all of the ore shipping ports 2,520,000 tons of iron ore. The shipment for the same month last year amounted to 2,375,000 tons, the increase this year being 145,000 tons. This increase is commensurate with that which has been shown during all the months of the season, with the possible exception of August, which showed a slight falling away. The fact brought out, also, in view of the light chartering this fall, is that this year's contract tonnage is almost equal to both the contract and wild tonnage of last year. The figures further show that there has been brought down the lakes so far this season about 14,900,000 tons of ore, which is an increase of about 1,840,000 tons over what had been carried to the first of October a year ago. This, however, is not altogether due to the additional carrying power of the boats, nor to the dispatch the boats have been given, for it will be remembered that the season opened this year much ahead of what it did in 1899, and also, incidentally, much earlier than the vesselmen had expected. The figures are interesting to many as showing how much ore it is likely that the boats will be able to carry down this year, for it is now almost assured that the shipment will exceed expectations. If the original 18,000,000 tons are adhered to there will be but 3,100,000 tons yet to move, which, if the September rate is kept up, will leave but 580,000 tons for the month of November. The general belief is, however, that the ore boats will run on through November and on into December, exceeding the original limit largely.

NAVIGATION OF ILLINOIS RIVER.

One of the collateral results of the opening of the Chicago drainage canal has been the rivival of traffic on the Illinois river below La Salle, which city has for over fifty years been the nominal head of navigation. Below La Salle the river has been improved by system of dams, making a slackwater channel; but what with low water and the natural filling of the river bed in the slackwater basins, there has been little regular navigation of the river above Chillicothe, or Hennepin, for several years. The opening of the drainage ditch has, however, raised the water level of the river between two and three feet and restored the stage of water in the river to the ancient low water datum.

"As a result we are able to load grain barges to their full depth and get to market without the delays formerly so common on the river," said the agent of the Turner-Hudnut Co.'s elevator at Chillicothe to a Chicago Record reporter. "Freight in full boatloads is less than freight in half loads, and we are able to buy grain—and are buying it—half a cent a bushel closer than last year. Our elevator will handle 200,000 bushels of corn and oats this fall, on which we will pay not only the naturally higher prices this year but $10,000 besides, representing the famers' share of the cheapening of transportation. That can be credited to nothing else than the opening of Chicago's canal, which has sent the new flood down the valley."

There has not been, unfortunately, any corresponding effect on the water level of the old Illinois & Michigan canal, running from La Salle to Chicago, since the flood of drainage canal water affects Illinois river only. Years ago the business of the canal in grain began to decline. A part of this was natural, for the new railway lines took the grain that previously had been hauled for the longest distances. Another part of the decline was unnatural, since the grain and other traffic—except stone from the Joliet-Lemont quarries—left the canal to go to the paralleling railway. When the railway made up its mind it wanted the canal grain and lumber, it made a rate to get them, just as the Record says a 5-cent rate on grain, with a 1-cent rebate, was made from Chillicothe to Chicago to stop the Turner-Hudnut corn from going down the river; and so, despite big conventions held at canal towns some years ago to head off this movement and to work up a sentimental interest in a revival of "the old canal," the railway has gradually taken the big end of the canal's business, even from canal towns and canal elevators, not a few of which have their switch-tracks laid on the canal banks under the old canal loading spouts.

The result has been that the canal revenues have declined and the canal itself has been allowed to go out of repair. Its feeders are filled up, the canal itself needs dredging for its entire length, its aqueducts need repairing and the Lockport-Chicago end, filled as it is with twenty-five years' accumulations of Chicago sewage sludge, is scarcely navigable. Until the canal is dredged and reopened to boats carrying a full load it can never again be of any weight as an arbiter of rates as in the old days.

Of course, there is little prospect of a return to canal conditions of forty years ago, when railroads were few and far between and when the canal elevators were able to pay a price for grain that took every kernel within thirty miles of the canal or Illinois river during the navigation season; but the Record says that, "encouraged by the prospect of increased depth of water, because of the Chicago canal, the Turner-Hudnut Co., of Pekin, last year acquired the long-idle river elevators in all these cities, and bought grain for the Pekin and Peoria market, diverting it from Chicago. The corn goes to the Pekin distilleries and the oats are clipped in that city. They bought last year nearly 200,000 bushels of grain at Chillicothe at a rate which the railroad elevator could not equal. They bought at other cities in the same way, and the Illinois river experienced a slight boom."

BUFFALO-TIDEWATER GRAIN POOL.

The New York Central, West Shore, Erie, Lehigh and Lackawanna roads have formed a pool of the grain traffic by rail from Buffalo to tidewater. So states the American Elevator and Grain Trade, Chicago. The Vanderbilt lines, the New York Central and West Shore, get, it is said, 55 per cent. of the traffic, the Erie 25 per cent. the Lehigh 16 per cent. and the Lackawana 4 per cent. Frank Harriot, late of the Erie, will be manager of the traffic and handle the contracts to check up the business of each road. On the strength of this arrangement grain rates east of Buffalo, which had been cut to the lowest rate on record, were restored September 19 to 3 cents, including Buffalo elevator and New York lightering charges. It is stated that the Pennsylvania lines will co-operate with the roads named above by making a corresponding rate from its Lake Erie ports to tidewater.

This general statement is denied, however, by the railroads, whose representatives say the popular idea of the "pool" is entirely erroneous; that Mr. Harriot's business is simply to keep tab on the tonnage of the various roads so that their executive officers may know what each of their competitors is doing. At any rate, if it is a pool, it is claimed, it is not "strictly a pool," inasmuch as the subscribing companies do not pool their grain traffic earnings, but simply divide the business.

Some New York men are inclined to look on the pool with favor because it is thought to be the purpose of the roads to favor New York, and it is cited as a "straw" to that affect that the British S. S. Zampa on September 24 was loading 140,000 bushels of wheat from the iron elevator at the foot of Degraw Street, Brooklyn, being the first steamer to load grain at that elevator for many months.

Another theory for the pool is that it is a movement "to head off further agitation for the enlargement of the Erie canal by showing how completely the grain forwarding trade is under the control of the trunk lines. It is anticipated that the intention of the trunk lines is to maintain a low freight rate until every canal barge is put out of business. The canal business is about on its last legs," said a prominent vessel broker, "and I reckon the railways have formed a grain pool because they think the time is ripe to give the canal business a knock-out blow."

PULVERIZED COAL AS FUEL.

Some peculiarly novel and interesting experiments made recently in Chicago with pulverized coal as fuel indicates the possibility of a radical change in the coal using conditions of great manufacturing plants requiring steam power.

Even with all the best modern appliances at command, the burning of ordinary coal in furnaces is a process so wasteful when results are compared with the potential energy liberated, that a veritable flood of inventive talent has been poured around the problem of increased fuel efficiency. Pulverized coal is a contribution to the list of attempts at solution which have already shown valuable results under careful tests, and may eventually supercede the familiar form of this fuel. As shown in the experiments at Chicago, conducted under the direction of Illinois Central railway officials, the new preparation of coal burns in an ordinary furnace just like gas, with no waste and no residuum. The finely pulverized coal, blown into the furnace with a due admixture of air, flashes into gas and is instantly consumed. An increase of from 25 to 40 per cent. in the steam producing capacity of the coal used has been certified to by the engineer experts who conducted the Illinois Central series of experiments.

Manifestly, if the results thus shown can be reproduced at will elsewhere, there will be little delay in the general installation of the new process of fuel treatment and combustion. The saving in coal alone in one year would amply cover the cost of the new machinery required, while the further relief from noxious gasses, slag, cinders and waste, and from the intolerable nuisance of heavy black smoke would be a public boon of great value. It is to be trusted that this elaborately heralded new device is not, like so many others, a mere pretense and illusion destined to early obscurity and oblivion.

THE ALPENA WRECKED.

Between midnight and daylight of Oct. 16, 1880, the side-wheel passenger steamer Alpena, of the Goodrich Line, went down with all on board somewhere, it is thought, between Racine and the east shore, during an equinoctial storm which is well remembered to this day for its severity. Like the ill-fated Chicora, she simply dropped out of sight, where, no man could tell, for the long search for the hull was never rewarded; under what circumstances none will ever know, for during the twenty years which have passed since that awful night no survivor has ever been found to tell the tale. The bodies and wreckage that piled up on the Michigan shore between Holland and Grand Haven for days after, bore the only witness of the disaster, but gave no clew to the cause.

At the government marine office in Chicago is an old record in which is given the opinion of the late Capt. A. E. Goodrich of the cause and manner of the wreck. "Capt. Napier was a man of courage," says this record. "He had that bulldog tenacity that would not give up as long as there was a fighting chance. The Alpena was last seen about thirty miles off Chicago. Instead of squaring off for Milwaukee, as he might have done, the captain fought the storm until the sea got so big that when the boat dropped into the trough of the sea her freight shifted to leeward. One wheel was pitched out of water and the captain was not able to right her. She probably stood in that position until the sea knocked her to pieces, which was probably a good many hours after. I think she rode out the storm and did not go to pieces until the wind shifted. That was Sunday night."

THE six submarine vessels of the Holland type, which have been ordered by the government are to be named the Adder, the Grampus, the Moccasin, the Pike, the Porpoise and the Shark.

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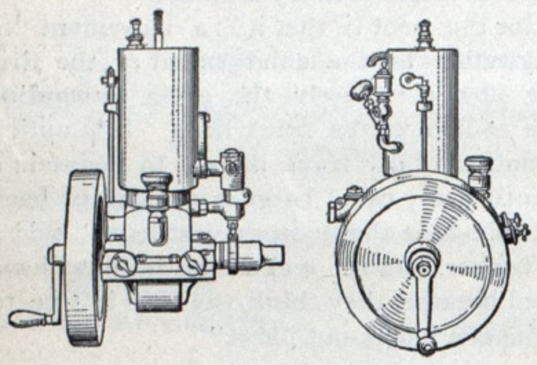

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AN IMPORTANT INDUSTRY.

The American Ship Windlass Co., Providence, R. I.. have within ten days shipped to the American Ship Building Co.'s order two No. 8 steam capstan windlasses to Lorain, Ohio, and now on top of this comes this big order from the same company:

Chicago Ship Building Co.—Hull No. 43, 1 No. 8 steam capstan windlass, 1 No. E steam capstan; hull No. 44, 1 No. 8 steam capstan windlass, 1 No. E steam capstan; hull No. 45, 1 No. 8 steam capstan windlass, 1 No. E steam capstan; hull No. 46, 1 No. 8 steam capstan windlass, 1 No. E steam capstan; hull No. 47, 1 No. 8 steam capstan windlass.

Detroit Ship Building Co.—Hull No. 139, 1 No. 8 steam capstan windlass, 1 No. F steam capstan; hull No. 140, 1 No. 8 steam capstan windlass, 1 No. F. steam capstan.

Lorain Shipyard.—Hull No. 305, 1 No. 8 steam capstan windlass, 1 No. F. steam capstan; hull No. 306, 1 No. 8 steam capstan windlass, 1 No. F. steam capstan; hull No. 307, 1 No. 8 steam capstan windlass, 1 No. F. steam capstan; hull No. 308, 1 No. 8 steam capstan windlass, 1 No. F. steam capstan.

Globe Shipyard.—Hull No. 405, 1 No. 8 steam capstan windlass, 1 No. F. steam capstan; hull No. 406, No. 8 steam capstan windlass, 4 No. E steam capstan.

Superior Ship BuildingCo. —Hull No. 500, 1 No. 8 steam capstan windlass, 1 No. F. steam capstan; hull No. 501, 1 No. 8 steam capstan windlass, 1 No. F steam capstan.

West Bay City Ship Building Co.—Hull No. 600, 1 No. 6 steam capstan windlass, 1 No. E. steam capstan, 1 No. 2 steam towing machine; hull No. 601, 1 No. 6 steam capstan windlass, 1 No. E steam capstan, 1 No. 2 steam towing machine; hull No. 602, 1 No. 8 steam capstan windlass, 1 No. F steam capstan; hull No. 603, 1 No. 8 steam capstan windlass, 1 No. F steam capstan.

IN 1899 the United States, the foremost pig iron producing country of the world, surpassed its former highest record, turning out 13,620,703 gross tons of pig iron. To supply the raw material for this amount of iron, the iron ore mines were actively wrought, and probably over 24,000,000 gross tons were mined. Until 1893 the United States was practically a producer for the home market only; but in that year the exports of iron and steel exceeded in value the imports and the difference has become annually more marked, until in 1899 the value of the iron and steel exports were $105,689,645, and that of the imports only $15,799,206. Most of the exports were manufactured products, thus securing a larger remuneration to producers than if they had been raw material. The iron and steel exports of 1899, included steel rails, valued at $6,122,382; wire, $5,526,930; pig iron, $3,282,241; plates and sheets, $2,047,301; wire nails and tacks, $1,955,773; castings, $1,348,133 and cut nails, $482,382.

THEY SEEM TO ENJOY IT.

To the Editor of The Marine Record:

CLEVELAND, O., October 16, 1900.

I received the following communication yesterday:

The lightship which marks the wreck of the Martin is carried away by passing vessels on an average of every other day. If this continues to be the rule the government officials will doubtless cause its removal, as there is apparently nothing but carelessness on the part of vessel masters to cause its being run down.

The statement above is perfectly absurd, and the person who wrote said article does an injustice to vessel masters, and at the same time, shows how ignorant he is of the conditions and circumstances with which vessel and steamboat masters have to contend in navigating the St. Clair river, especially at its entrance from Lake Huron.

No steamboat or vessel master would willfully remove, by collision or otherwise, a lightship located at a certain place for their protection. The removal of the lightship mentioned is not the result of carelessness, but is the result of conditions arising from the current, which is effected by obstructions.

There is no class of men more careful in the avocation they follow than the steamboat and vessel masters of the northwestern lakes and rivers.

C. E B.

A TREASURY DECISION.

SPECIAL TAX—EXHIBITION ON A BOAT.

In case of an exhibition or show for money given on a boat moving from place to place on rivers, the proprietor must hold a special tax stamp for each state in which the boat lands and such exhibition is given.

TREASURY DEPARTMENT,
OFFICE OF COMMISSIONER OF INTERNAL REVENUE,
WASHINGTON, D. C., October 9, 1900.

SIR—In reply to your letter of the 2d instant, stating that you are "requested to issue a special tax stamp for a public exhibition, being an entertainment by a single phonograph, for which an admission is charged, maintained on a boat traversing the Mississippi river and its tributaries," you are hereby advised that the special tax stamp should be issued by you for this exhibition expressly for the state of Missouri. The special tax stamp then, under the statute, will be good for any landing place within that state. When the boat lands at any place in another state the proprietor of the exhibition must take out a special tax stamp for that state, and so on. A special tax stamp must be taken out for each state in which this boat lands and the exhibition is given.

Respectfully,

ROBT. WILLIAMS, JR., Act. Commissioner.

H. C. GRENNER, Collector 1st Dist., St. Louis, Mo.

THE steamer Paraguay will leave Lorain for the coast at the end of this month.

NOTES.

IT is stated that a fleet of five vessels with a capacity of 15,000 tons, will be engaged next season to operate in connection with the Great Northern Railway.

THE name of the five-masted schooner now being built by H. M. Bean at Camden, Me., for Capt. Murdock McLean, will be Van Allens-Broughton. The new five-master will carry about 3,500 tons.

A six-masted schooner was launched at Bath, Me., on Wednesday last, from Percy & Small's shipyard. She will be named the Eleanor A. Percy, will carry 5,000 tons of coal and will load her first cargo at Philadelphia or Baltimore.

THE great ice-breaking steamer, which was built for the Siberian Railroad to use in conveying trains across Lake Baikal, is described by Henry Norman and pictured in the November Scribner's. This steamer can crush through ice 20 feet thick.

BETHLEHEM forgings have again scored in the remarkable results attained in the trial trips of the U. S. battleship Wisconsin and Russian cruiser Variag. The Wisconsin's shafts were forged from fluid-compressed nickel steel, and those for the Variag from fluid-compressed carbon steel, all being shaped under the hydraulic press, carefully annealed and finished according to standard practice at the Bethlehem Steel Co. works. They have just cause for pride in the performance of both ships.

A penalty of $200 and forfeiture of the property in question was recently imposed by the collector of customs at Port Huron against Thomas Lillis owner of the tug John Owen, because of a violation of the navigation rules for the government of the St. Mary's river, on or about Sept. 14 last. The offense consisted in passing down the new channel with a raft of logs in tow, which interfered somewhat with the work now in progress there. As Mr. Lillis has a good record as an observer of the laws, according to the collecter, Gen. Spaulding ordered that the penalty imposed be mitigated to a fine of $15.

THE navy officials are perplexed over the unexpected report which has come from the Board of Civil Engineers detailed to determine the extra cost of building concrete docks at the Mare Island (Cal.) and League Island (Pa.) navy yards, instead of timber structures, which were originally contracted for. It was expected that the additional expense would not be more than $350,000, making the total cost of each concrete dock about $1,000,000. The contracts for the timber docks were about $750,000 each in amount. The Board of Officers which has been attempting to adjust the extra cost at Mare Island finds that the expense will be fully double the amount originally estimated, while the contractors insist that they are entitled to an additional $1,000,000 on each of the two docks on account of the change in the specifications.

NOTICE TO MARINERS.

LIGHT-HOUSE ESTABLISHMENT,
OFFICE OF THE LIGHT-HOUSE INSPECTOR, 11TH DIST.,
DETROIT, MICH., October 11, 1900.

PORTAGE RIVER, MICH. The keeper of the light recently established on the easterly side of Portage river at High Point, about five miles above the Houghton and Hancock bridge reports that it was destroyed by fire between 2 and 3 o'clock this morning.

By authority of the Light-House Board.

J. C. WILSON, Commander U. S. N.
Inspector 11th Light-House District.

UNITED STATES OF AMERICA—NORTHERN LAKES AND RIVERS—WISCONSIN.

TREASURY DEPARTMENT,
OFFICE OF THE LIGHT-HOUSE BOARD,
WASHINGTON D. C. October 13, 1900.

KENOSHA BREAKWATER BEACON LIGHT STATION.—Notice is hereby given that, on or about October 20, 1900, a fixed red lens lantern light will be established at the southeasterly end of Kenosha Breakwater, Kenosha Harbor, westerly side of Lake Michigan. The light will be suspended from a brown iron post, at a height of about 30 feet above mean lake level.

Immediately in front of the lake side of the post there is a V-shapped timber protection 6 feet high and 18 feet each way.

By order of the Light-House Board.

FRANCIS J. HIGGINSON,
Rear Admiral, U. S. Navy, Chairman.

DOMINION OF CANADA—ONTARIO.

STRIBLING POINT RANGE LIGHTS.—From and after the 10th October instant, the Canadian Government proposes to maintain range lights at Stribling point, on the north end of St. Joseph Island, in the district of Algoma, Ontario, to replace the priviate lights heretofore maintained by the Lake Carrier's Association.

The lights will be fixed white catoptric lights shown from lanterns placed in front of the day beacons already in existence; that is the front light will stand where the back light of the private range is now maintained.

The targets of the day beacons are diamonds or lozenges, 6 feet square, painted white. The front target has a vertical black stripe through the middle of the diamond.

It stands just inside the shore line, on low land.

The light will be elevated 11 feet above the water and should be visible 4 miles in the line of range.

The back light is situated on the hillside, 1,446½ feet S. 68° 17′ 40″ E. true from the front light. It is elevated 44 feet above water, and should be visible 4 miles in the line of range.

The two lights in one, bearing S 68° 17′ 40″ E. true, lead through the middle of the dredged channel of the Middle Neebish from its intersection with the alignment of the lower Hay Lake range lights to its intersection with the alignment of the Harwood point range lights.

F. GOURDEAU,
Deputy Minister of Marine and Fisheries.

Department of Marine and Fisheries,
Ottawa, Canada, 2nd October, 1900.

☞ All bearings, unless otherwise noted, are magnetic and are given from seaward, miles are nautical miles, heights are above high water, and all depths are at mean low water.

Pilots, masters or others interested are earnestly requested to send information of dangers, changes in aids to navigation, notices of new shoals or channels, errors in publications, or any other facts affecting the navigation of Canadian waters to the Chief Engineer, Department of Marine and Fisheries, Ottawa, Canada.

SHIPPING AND MARINE JUDICIAL DECISIONS.

(COLLABORATED SPECIALLY FOR THE MARINE RECORD.)

Collision—Ferryboat and Anchored Vessel in Fog.—Evidence held insufficient to establish fault on the part of a steamship anchored in the Delaware river at Philadelphia for a collision between a ferryboat and such vessel in a fog. The City of Reading, 103 Fed. Rep. (U. S.) 696.

Collision—Moving and Moored Vessels—Presumption of Fault.—A collision of a moving vessel and one moored raises a presumption of fault on the part of the moving vessel, which imposes upon her the necessity of explanation of the presumed culpability. The Dean Richmond, 103 Fed. Rep. (U. S.) 701.

Sailing Vessels Crossing.—A schooner sailing free held in fault for a collision with one on a crossing course, sailing closehauled, because of her failure to maintain a proper lookout; and evidence to show contributory fault in the privileged vessel held insufficient. The William Churchill, 103 Fed. Rep. (U. S.) 690.

Admiralty—Recovery of Costs—Unnecessary Litigation.—Where litigation between a carrier and shipper over the payment of freight was wholly unnecessary, and was caused by the unreasonable conduct of both parties, a court of admiralty will require each party to pay its own costs. The Asiatic Prince, 103 Fed. Rep. (U. S.) 676.

Shipping — Unseaworthiness of Lighter — Liability of Owner.—Evidence held to establish the unseaworthiness of a barge let by its owner to perform lighterage service, and to render its owner liable for the loss resulting to the hirer by its sinking at the dock after being loaded. Tygert-Allen Fertilizer Co. vs. Hagan, 103 Fed. Rep. (U. S.) 663.

Collision—Overtaking Vessels.—Evidence considered and held to show that a collision between two steamships, one of which was attempting to pass the other, was due to the fault of the overtaking vessel, which, after passing, relying upon her greater speed, attempted too soon to cross the bows of the other. The Wilkommen, 103 Fed. Rep. (U. S.) 699.

Collision—Steam Vessels in Fog—Evidence Considered.—Evidence in support of a libel and cross libel for collision considered, and held insufficient to show that a collision between two steamers in East river during a fog was due to negligent navigation on the part of either vessel, and both the libel and cross libel dismissed. The West Brooklyn, 103 Fed. Rep. (U. S.) 691.

Liability of Carrier for Injury to Cargo—Negligence in Handling.—The breaking of a greatly unusual number of bags, in which a cargo of sugar was shipped, in discharging, raises a presumption of negligence on the part of the ship in handling, and, if unexplained, renders the carrier liable to the shipper for the loss and expense resulting. The Asiatic Prince, 103 Fed. Rep. (U. S.) 676.

Salvage—Amount of Recovery.—A steamer of the value of $40,000, being without rudder, and aground in shoal water in a rough sea, was towed by libelants' tug to a place of safety; but neither the tug nor any of her crew was exposed to the slightest danger in performing such service, and the ordinary charge for the towing of the vessel would have been $175. Held, that the libelants were entitled to recover $1,000 as salvage, three-fourths of which sum should go to the tug, and the balance to her master and crew, in proportion to their wages. The Grace Dollar, 103 Fep. Rep. (U. S.) 665.

Shipping—Lien for Freight.—Where the consignee and owner of a cargo fails to pay or tender the freight due on the discharge of the cargo, the carrier to preserve its lien is authorized to retain and store sufficient of the cargo to pay such freight, and the expense of storage and loss of use of the commodity must be borne by the owner. The Asiatic Prince, 103 Fed. Rep. (U. S.) 676.

Collision—Contributory Fault—Burden of Proof.—Where the fault of the burdened vessel was the primary cause of a collision, she must produce reasonably clear evidence to sustain a plea of contributory fault on the part of the privileged vessel on the ground that the latter, in trying to avoid the threatened collision, departed from her course. The William Churchill, 103 Fed. Rep. (U. S.) 690.

Collision—Improper Anchorage—Fault of Pilot.—An ocean steamship, brought up the Delaware river to Philadelphia at night by a pilot, and anchored, cannot be held in fault for a collision while at her anchorage because the pilot placed her outside the anchorage grounds set apart by the regulations of the port, which fact was unknown to her officers. The City of Reading, 103 Fed. Rep. (U. S.) 696.

Reducing Speed and Changing Course Excused.—A steamship cannot be held in fault for reducing her speed and changing her course where another vessel, after overtaking and passing her, turns to cross her bows, and collision is certain if she maintains her speed and course, and where her action, although it does not prevent, in fact lessens the force of the collision. The Wilkommen, 103 Fed. Rep. (U. S.) 699.

Vessel Lying at End of Pier—New York Charter Provision.—Section 879 of the New York City charter, relating to the mooring of vessels at the ends of piers, does not relieve a moving vessel from liability for collision with a vessel so moored, which did not unduly obstruct navigation, and where the moving vessel was not seeking entrance to an adjoining slip. The Dean Richmond, 103 Fed. Rep. (U. S.) 701.

Admiralty—Appeal—Requiring Amendment of Pleadings.—Where the pleadings in a suit in admiralty are so deficient that the court on an appeal cannot properly apply the evidence in the record, or justly determine the rights of the parties, but there is apparently no design to suppress the facts, the decree below will be set aside, and the case remanded for the filing of new pleadings. Smith et al. vs. Elmer E. Wood Transp. Co., 103 Fed. Rep. (U. S.) 685.

Navigable Waters—Obstructions—Liability of City.—A city, though charged by statute with the duty of keeping the channels of navigable streams within its limits free from obstructions, cannot be held liable for injuries caused by a sunken wreck, on the ground of negligence, where the owners had contracted with a wrecking company to raise the vessel, and it is not shown that such company was not prosecuting the work with ordinary diligence and reasonable efficiency. McCaulley vs. City of Philadelphia, 103 Fed. Rep. (U. S.) 661.

Pilots—Negligent Service—Liability of Pilots' Association.—The Pilots' Association of the bay and river Delaware, which is an uncorporated association of pilots, intended to further the interests of its members in various ways, but having no power to make contracts for pilotage service, its members acting individually in that matter, does not stand in the relation of principal as to such contracts, and is not liable for the negligence or fault of one of its members in the performance of a contract for his service. The City of Reading, 103 Fed. Rep. (U. S.) 696.

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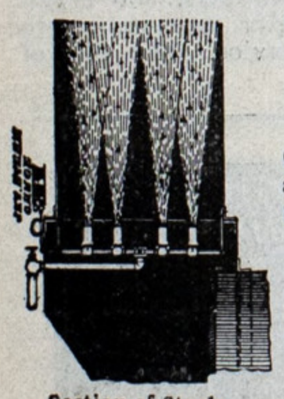

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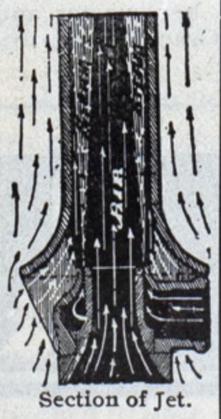

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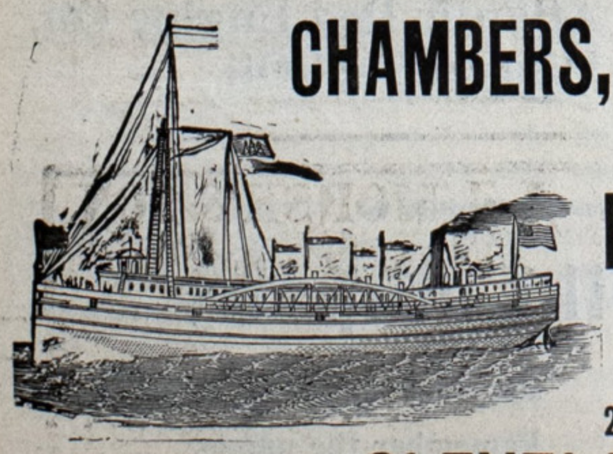

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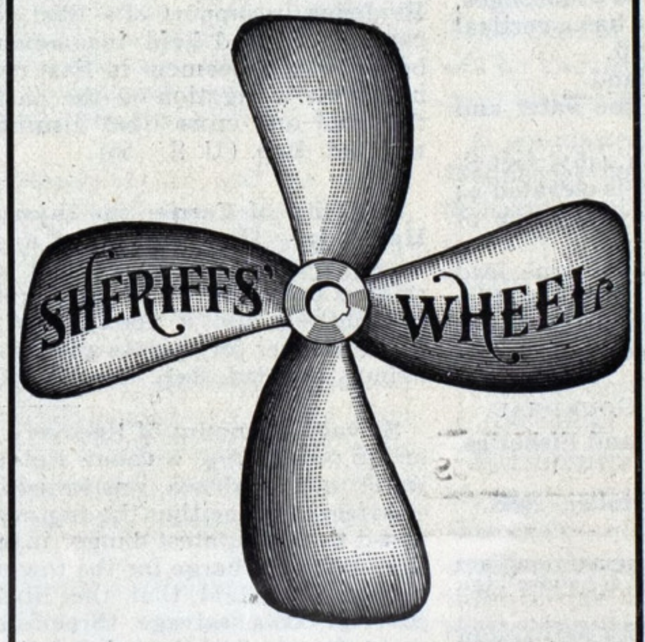

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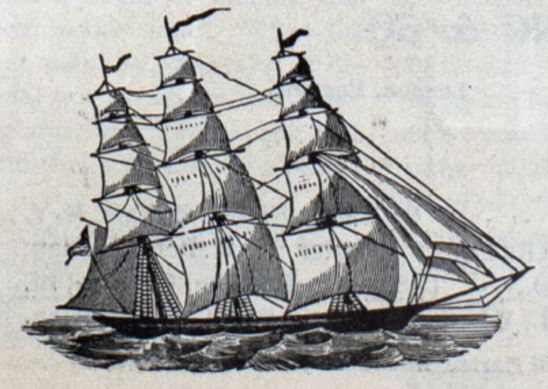

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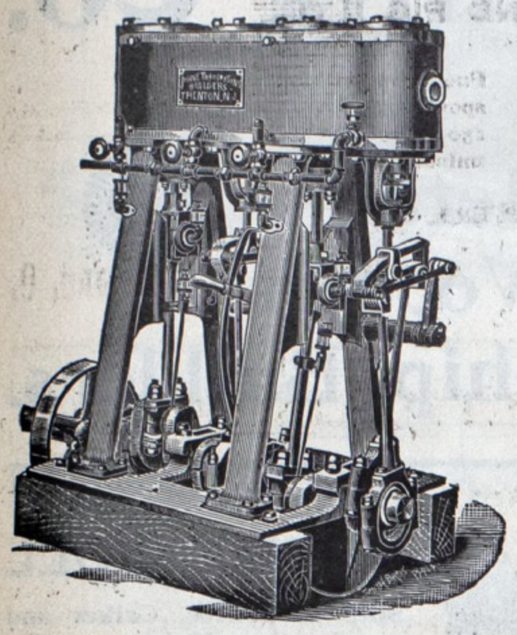

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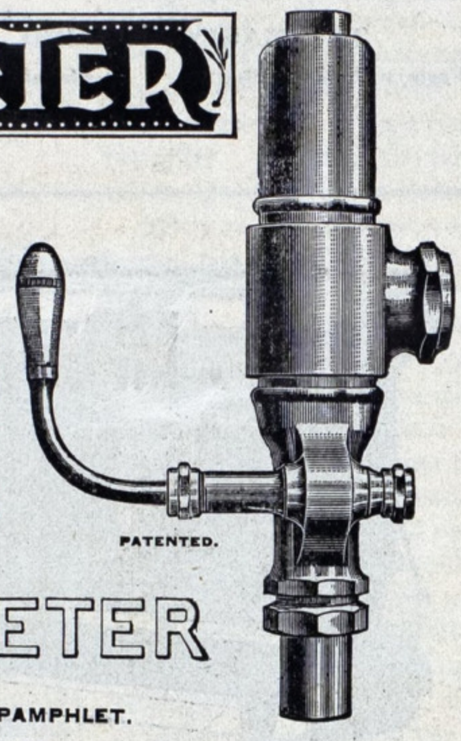

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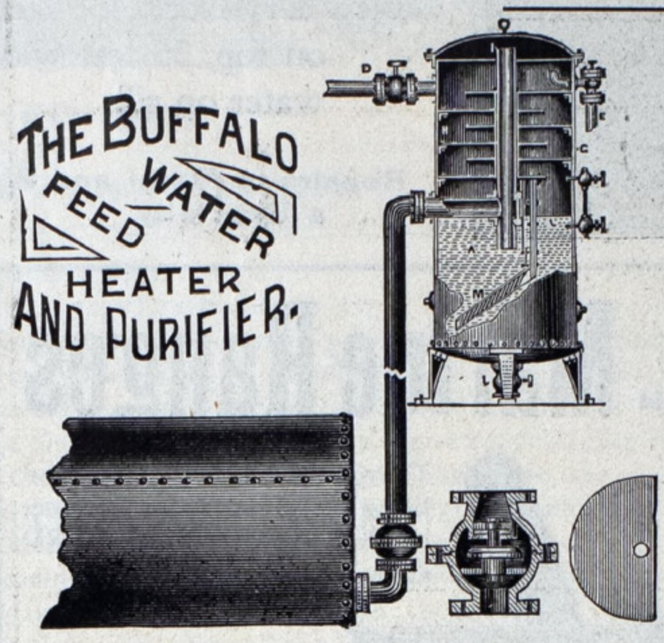

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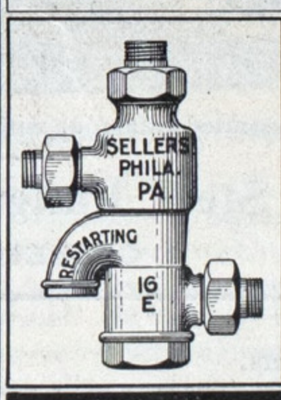

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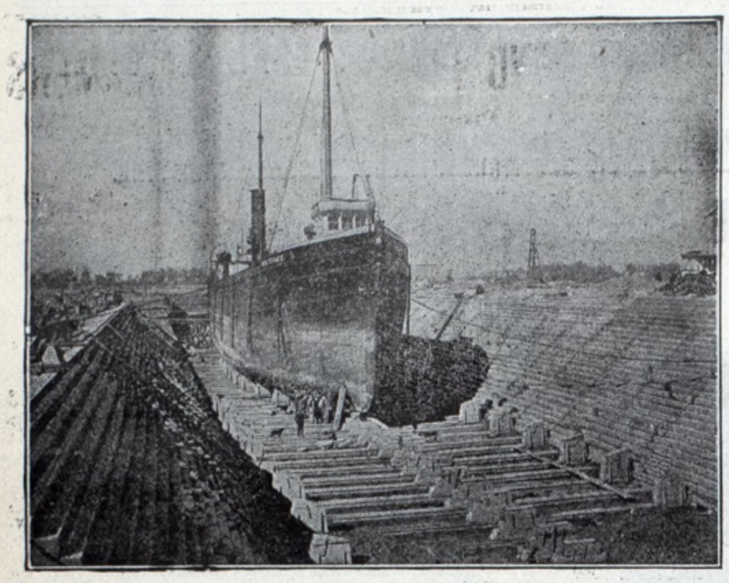

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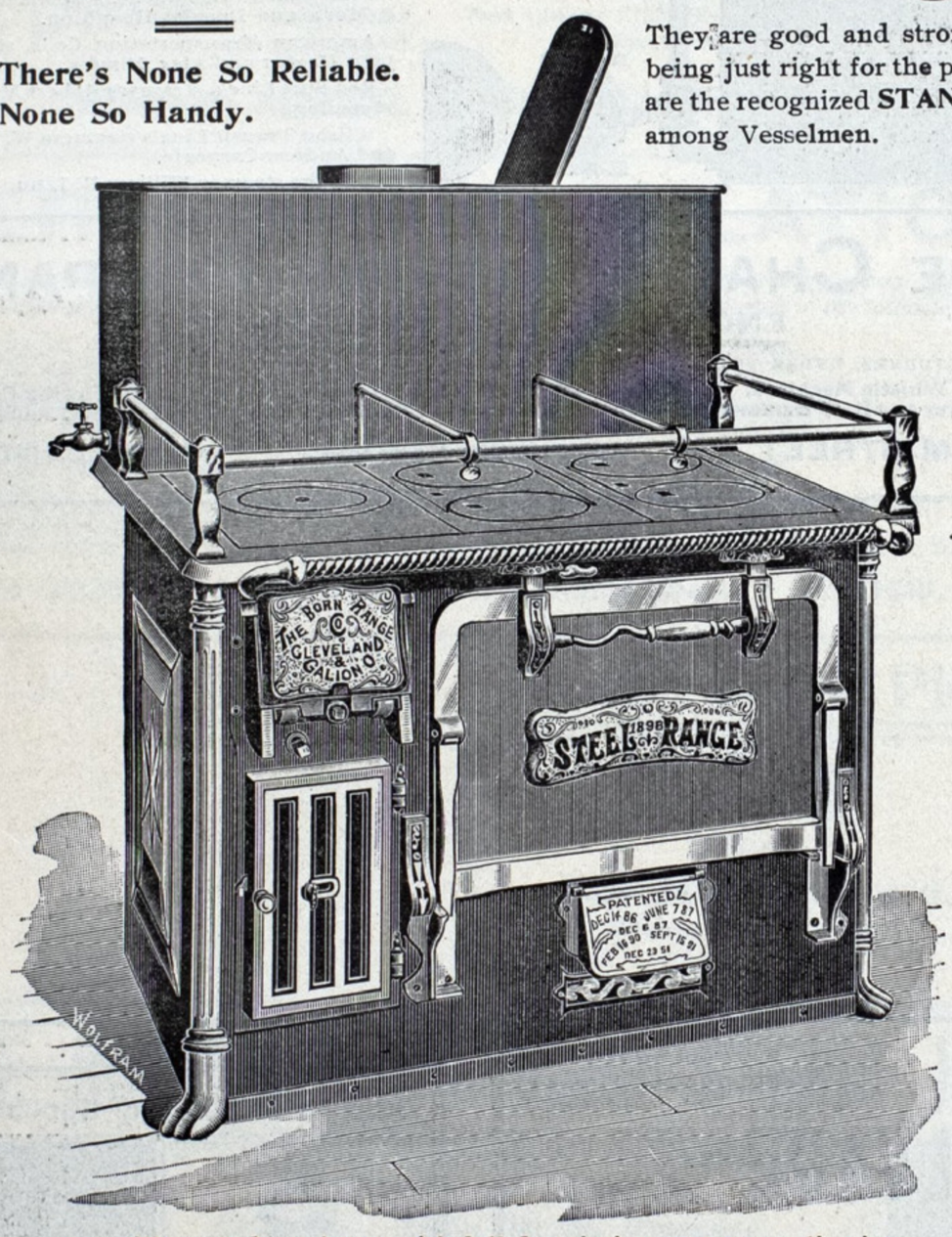

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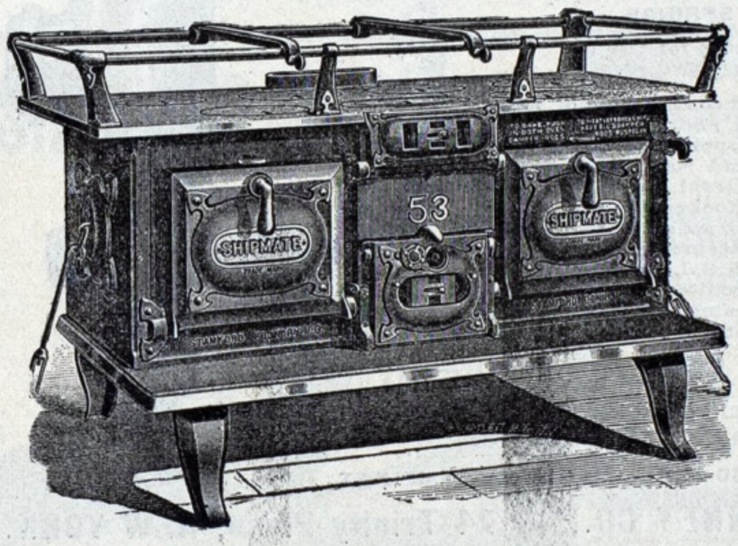

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